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November 1, 2016

Council President Herb Wesson
Los Angeles City Council
200 N. Spring Street
Los Angeles, CA 90012
holly.wolcott@lacity.org

Submitted by email to and hand delivered

Re: Council File 16-1011 and 16-1011-S1 (8150 Sunset Boulevard)

Dear Honorable Councilmembers:

Fix the City urges the City Council to reject the PLUM Committee's approval of the 8150 Sunset project. In addition to the points that Fix the City and other appellants and members of the public have previously raised regarding the project's size, impacts, and dangerous location near a surface fault, Fix the City wishes to bring some significant additional legal concerns to the attention of the Council. We incorporate by reference all other documents and testimony submitted for this project.

The density bonus granted under SB 1818 does not waive compliance with four separate state laws: the Alquist-Priolo Act, the Subdivision Map Act, the California Environmental Quality Act, and the California Streets and Highways Code provisions on street vacations. The project, as approved, violates all four state laws. The city's response to our appeal is not supported by substantial evidence and relies on bare assertions to support the majority of its conclusions. The applicant has not yet responded in writing to the appeals, or the response has not yet been posted by the City Clerk as of late afternoon on October 31, 2016.

ZONING INCONSISTENCY

The project's approval permits a 3:1 Floor to Area Ratio (FAR) in spite of a specific zoning limitation imposed as a D condition that limits FAR on the site to 1:1. The proper legislative procedures have not been followed by this project. It has not obtained either a height district change under LAMC 12.32 F, to remove the D limitation, or a clarification of the D condition under LAMC 12.32 H. None of these types of actions have been requested or granted. Other projects in the Hollywood area that are subject to similar D conditions have been required to obtain zone changes to conform their zoning to the use. Moreover, LAMC 17.15 D requires that a tract map disclose any zoning inconsistency: this vesting tentative tract map does not disclose any zoning inconsistency. Finally, Fix the City questions whether City Planning form

4043 was ever completed for this affordable housing project. The form requires disclosure of D limitations.

The D limitation was a *General Plan* EIR mitigation that cannot be overridden by a *project –level* EIR. The 1:1 FAR permitted upzoning elsewhere in the Hollywood Community Plan area. The project's EIR shows that infrastructure – including streets, water supply, and public safety response services, is inadequate.

EMERGENCY RESPONSE AND TRAFFIC ISSUES NOT DISCLOSED OR FULLY ANALYZED IN LIGHT OF POTENTIAL HAVENHURST DRIVE CUL-DE-SAC

At the PLUM Committee hearing, the City of West Hollywood disclosed that it had entered a settlement regarding its appeal of the project. As media reports following the hearing indicate, the City of West Hollywood will receive funds to mitigate traffic, which it is considering using to create a cul-de-sac on Havenhurst so that the intersection of Havenhurst and Fountain *cannot* be used by project related traffic. (See Exhibit 1.) A cul-de-sac appears now to be a potential future consequence of the project, yet the impacts of such a cul-de-sac on traffic and emergency response have not been analyzed, evaluated, or disclosed to decision makers or the public. The failure to study this impact now means that any changes necessary to the design of the project to address potential circulation challenges from the cul-de-sac will be impossible. The full scope of the project under CEQA would include any likely future actions, including a cul-de-sac funded by a local government settlement agreement.

FIRE RESPONSE TIMES ARE INADEQUATE AND THERE ARE HAS BEEN NO DETERMINATION THAT THE INFRASTRUCTURE CAN ACCOMMODATE THE GROWTH PERMITTED BY THIS PROJECT

Los Angeles Fire Department (LAFD) response times at this location are inadequate at present, and under Framework Element policy 3.3.2 a project that triples density over permitted levels may not be approved. The Tract Map must be consistent with the General Plan Framework, and findings of consistency must be made by the City. If they are not, only conditional approval pending a height district change can be granted. Denial would be appropriate due to the public safety concerns with the proposed project.

The infrastructure in the area does not support development at present levels, let alone with the increases proposed by the Townscape project. Fix the City has utilized publicly available LAFD data to calculate average response times for the first-, second- and third-in responders to the project site. (See Exhibit 2.) The average response time in 2016 was 5:43 seconds for emergency medical services and 6:21 seconds for non EMS services. Average responses are not an accurate metric, however, as noted by Assistant Chief Patrick Butler in 2012: "This is an issue with using averages because they overlook outlier. . . If you are an outlier you want to make sure your response is on time. That is why we use the 90% figure." Even using an average, the response time is inadequate because the response time is below the NFPA standard (which the City has adopted) of 5:00 minutes. NFPA requires a response within 5:00 minutes 90% of the time. The response here is clearly far below that standard.

STREET VACATION NOT PROPERLY SOUGHT, ACCORDING TO CITY ENGINEER

Fix the City has consistently objected to the manner in which the project has proposed to build over a portion of Crescent Heights, removing a lane of traffic that permits free right turns from east bound Sunset Boulevard onto south bound Crescent Heights. Fix the City has confirmed with City Engineer Edmond Yew that the ***City Engineer has never reviewed the proposal to close the Crescent Heights turn lane***. (See Exhibit 3.) He states that the street vacation must be made a condition of approval for the tract map, and analyzed under CEQA. The City Engineer also confirmed that no B or R permit has been discussed as an alternative to a street a vacation. Of course, the EIR does not include these permits in its list of discretionary approvals for the project. None of the public outreach procedures that the City Engineer normally follows had been conducted for the removal of the right turn lane. The City Engineer also observed that an ordinance would be required for LADOT to "round off" the tip of 8118 Sunset to convert that part of the property to street use. An ordinance would be required to convert City property into a public right of way. Sale of 8118 Sunset would also require that the city declare the property to be surplus and follow appropriate procedures. The General Plan maps also show the street configuration as it currently is, with 8118 Sunset as a triangle alongside Crescent Heights. The project does not contain an amendment to the General Plan maps. Closure of the street also violates the due process rights of owners of private street easements.

IMPPROPER INTERPRETATION OF ALQUIST-PRIOLO PROHIBITIONS

The City's response to Fix the City's observation of the Alquist-Priolo Act violations in the project approval insisted that the Act permits the construction of structures for human occupancy within 50 feet of the fault zone even if it is unknown whether faulting is immediately present off site. This is not what the state law says, and multiple jurisdictions confirm that Fix the City's interpretation is correct. Indeed, in Environmental Impact Reports approved by the Los Angeles City Council, the City has clearly stated that the Alquist-Priolo Act requires a fifty foot setback from the trace of an active fault. (Exhibit 4, pp. 1-2.) In San Diego County, "the County requires that no structure for human occupancy shall be permitted to be placed across the trace of an active fault and that there is at least a 50-foot setback from the trace of an active fault for such structures. If the trace of the fault is inferred through portions of the project site, the setback distance will depend on the quality of data and type and complexity of fault(s) encountered at the site. The setbacks required on area of indirect interpretive methods will be more restrictive than the above-discussed 50-foot setback." (See Exhibit 5, p. 18.) Reinforced foundation is not listed as an acceptable mitigation. Other cities have similar interpretations of the Act's requirements. (See Exhibit 6.) The City has previously stated to the applicant here that the existence of a fault is presumed immediately offsite because there has been no off-site study. Yet the City is poised to approve a project that permits construction within 50 feet of the presumed fault, on the basis that the structure is not built directly *on* the fault. That twisted interpretation, contrary to the text of the regulation and cautionary intent of the Alquist-Priolo Act, threatens the safety of the future occupants of this project and the physical integrity of this structure. A fifty foot setback from the property line must be required.

Fix the City has raised serious concerns about the approval of the proposed project and its conformity to state and local law. Fix the City urges the City Council to deny the proposed project so that these concerns may be addressed and a less impactful project presented to the City for review.

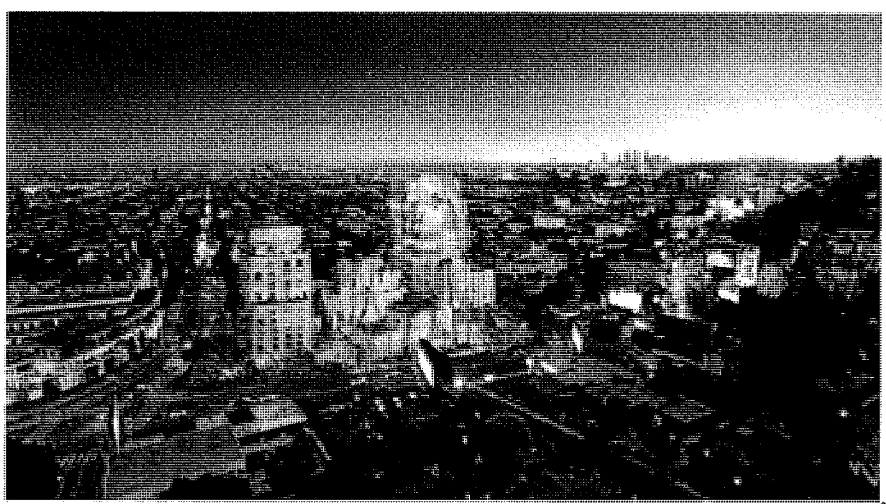
Respectfully submitted,

Beverly Grossman Palmer

Exhibit 1

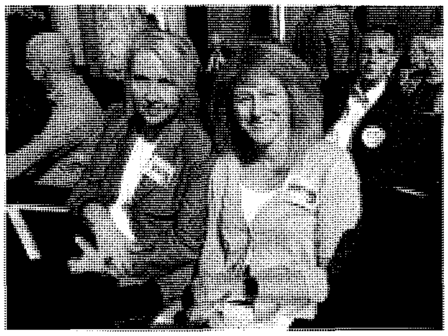
WeHo Strikes a Deal with Townscape and Supports 8150 Sunset Project

Wed, Oct 26, 2016 By James Mills 16 Comments



The City of West Hollywood has withdrawn its opposition to the controversial 8150 Sunset Blvd. high-rise retail and residential project after reaching an agreement with Townscape Partners, the project's developers. Located in Los Angeles on the southwest corner of Sunset and Crescent Heights boulevards, the 8150 project borders West Hollywood and raised concerns due to its height, massing, traffic and sewer impacts.

The withdrawal of the West Hollywood appeal, considered the strongest of five appeals against the project, helped pave the way for the Los Angeles City Council's five-member Planning and Land Use Management Committee to deny the other four appeals and approve the project on Tuesday. The project now moves to the full 15-member Los Angeles City Council for final approval, possibly as early as next week. Meanwhile, the Land Use committee delayed consideration of granting historic cultural monument status to the 66-year-old Lytton Savings building on the 8150 Sunset site until late November.



West Hollywood Mayor Lauren Meister (right) and Community Development Director Stephanie DeWolfe (left)

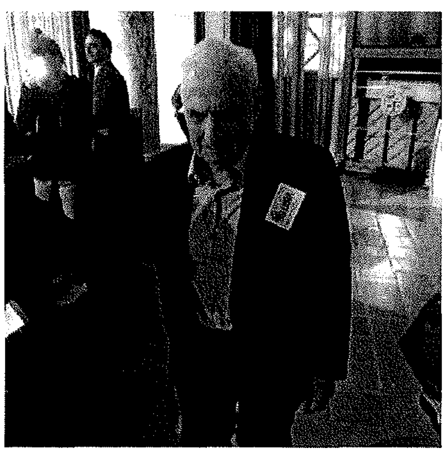
West Hollywood Mayor Lauren Meister, Community Development Director Stephanie DeWolfe and attorney Beth Collins-Burgard, who represented West Hollywood on this appeal, worked out a handshake agreement with Townscape in the minutes before the Land Use committee heard the 8150 project. Under the terms of the deal, the height of development's tallest building, once proposed for 234 feet, will be reduced to 178 feet as measured from the lowest point on sloping site. The top floor of that building will have a 10-foot setback on its southern side (which faces West Hollywood) so that the building will appear less tall, and mechanical equipment such as air conditioning compressors will be moved away from the WeHo border.

Additionally, Townscape will give West Hollywood $2 million for traffic improvements. Meister indicated to WEHOville that the city plans to erect bollards at the city's border along Havenhurst Drive (on the western side of the site) to create a cul-de-sac, similar to the cul-de-sac on Westmount Drive just above the Trader Joes grocery store. That cul-de-sac will prevent traffic leaving the 8150 Sunset project from turning left onto Havenhurst, thus preserving the residential street and thwarting Havenhurst from being used as a cut through street to Fountain Avenue. Townscape will also give the city more than $500,000 for sewer improvements, since the project will connect to West Hollywood's sewers.

The West Hollywood City Council must still approve this agreement, but Meister reported that the council had discussed what they wanted during a closed session and authorized her and DeWolfe to negotiate it.

"There were certain conditions that we wanted to lock in, that we felt were very important if this project was going to happen, and that was the money for the cul-de-sac and the sewer and reducing the height as much as we thought that would be possible," Meister told WEHOville.

Meanwhile, staffers for Los Angeles 4th District Councilman David Ryu, who represents the area in which the 8150 Sunset project sits, also negotiated modifications to the project after Ryu wrote a letter demanding changes to the project. When new developments are considered by the L.A. City Council, the council members usually defer to the wishes of their colleague who represents the area, so Townscape, which was initially resistant to changes, was apparently willing to make concessions to get the project approved.



Architect Frank Gehry

The number of residential units will be 229, down from 249. Twenty-six of those units will be for very-low income residents and 12 will be "work force" units priced for more moderate income workers. The number of commercial parking spaces was increased per Ryu's request to 494. The sidewalk along Sunset Boulevard will be widened to 15 feet and Townscape will also give Los Angeles $2 million for traffic improvements.

The project's 65,000 square feet of commercial use remains unchanged. Plans call for a 25,000 square foot supermarket, a 5,000 square foot bank, 12,000 square feet of retail space and 23,000 square feet of restaurant space. The project, with curved edges and odd angles, is by celebrated architect Frank Gehry, the man who designed the Walt Disney Concert Hall in downtown Los Angeles.

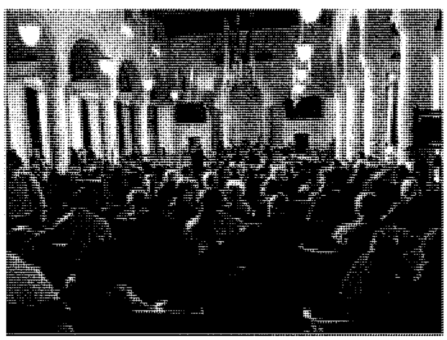
Speaking of the modifications, representatives for Ryu told the committee, "We agree with the modifications. We look forward to continued dialogue with our community as well as the appellants as this moves forward."

In a statement, Townscape partner Tyler Siegel, said, "These modifications will benefit the community, while ensuring that Frank Gehry's terrific design provides world-class residences as well as new shopping and eating destinations for our city."

The 87-year-old Gehry testified before the committee that the site would be "a great entry piece to the Sunset Strip." Gehry said he agreed to design the project because Townscape shared his values of creating something that would be "special," have "real architecture" and be "a proud part of the community."

A standing-room-only crowd filled the L.A. City Council chamber. During over two hours of public comment, many people wearing "Yes 8150 Sunset" stickers, which were provided by Townscape, spoke in favor of the project citing the jobs it would provide and the outstanding architecture. An equal number spoke against it, commenting about the increased traffic congestion and the impact to the neighborhood.

By 7:30 p.m. when public comment was completed, only three of the five committee members were still present (councilmembers Mitch Englander and Marqueece Harris-Dawson both left without explanation during the hearing). There was minimal discussion among the three, who unanimously voted to deny the appeals and approve the project.



Hearing on 8150 Sunset project at L.A. City Hall

"It would be nice if we could still live in the neighborhood that we grew up in, but that does not exist anywhere that I know of in the city," L.A. Councilmember Gil Cedillo, who serves on the Land Use committee, told the audience. "The fact of the matter is we have a housing crisis, an affordability crisis and a homeless crisis. We have to respond to that. Every single elected [official] in each of the 15 [council] districts has a duty and an obligation to respond to that. So, that's what this is."

Councilmember Curren Price questioned whether it was appropriate to approve the project before considering whether to give historic cultural monument status to the Lytton Savings and Loan building located on the northwest corner of the 8150 property. However, city staffers reported that "the historic hearing does not have any bearing on the approval of the project."

In mid-September the L.A. Cultural Heritage Commission unanimously agreed to grant the landmark status to the Lytton Savings building, designed by noted Southern California architect Kurt Meyer. Now a Chase Bank, the building with its zig-zag folded plate roof, glass walls and interior art work offered a radical architectural departure from traditional bank building when it opened in 1960.

The full L.A. City Council must approve the landmark status before it becomes official. If landmark status is granted, the Lytton Savings building can still be demolished, but there would be several extra legal steps involved before the wrecking ball could hit the building.

Members of Friends of Lytton Savings, the group which petitioned for the building's landmark status, reported that Townscape Partners indicated they were open to the idea of moving the building. However, a spokesperson for Townscape would not confirm that.

Adrian Scott Fine, director of advocacy for the L.A. Conservancy preservation group, reported that concrete buildings as large as the Lytton building would be especially difficult to move. Similarly, it is not clear where Townscape could move the building to.

"There's two preservation alternatives on the table that have been deemed viable and meet the project objectives," Fine told WEHOville. "Why is that not being discussed? Why is the city of Los Angeles ignoring that path forward that allows preservation and new development to happen at the same time? Personal preferences should not override state law or the heritage of Los Angeles."

Gehry seemed uninterested in adapting his designs to be compatible with the mid-century modern Lytton Savings building. Gehry explained to the committee that the construction crane needed to erect the project's two towers had to be placed in the location of the Lytton building.

"Unfortunately, the bank building is in a precarious position to enable craning a proper project on the site," Gehry said.

West Hollywood resident Rory Barish, who spearheaded the Save Sunset Blvd. group to oppose the project, believes the committee was blinded by Gehry's status as a world-renowned architect.

"They're viewing Gehry as a god. That's why he was here today," said Barish, who lives on Havenhurst adjacent to the project. "That's why Townscape hired him, to help get this approved."

After the hearing, Steven Luftman, who helped found the Friends of Lytton Savings group, commented to WEHOville, "This could be an amazing opportunity to have two of the most significant architects of Los Angeles together in one project. I don't know what it is that's keeping it from happening. I find it terribly sad that one architect would want to erase another's work."

Tagged 8150 sunset blvd., community development director stephanie deWolfe, david ryu, frank gehry, L.A. City Council, mayor lauren meister, Townscape Partners, West Hollywood city council

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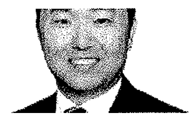

L.A. City Councilmember David Ryu Presses for Changes in 8150 Sunset Project

WeHo Celebrates Historic Preservation on Thursday

16 Comments

carleton cronin Wed, Oct 26, 2016 at 8:44 am

Staring the future full in the face, this large project should spur West Hollywood and other cities bordering Los Angeles to start talking with the boys and girls in LA City Hall. Infrastructure must keep apace with such developments – actually, run ahead of them, and there has to be great mutual assistance for upgrades and extensions. Density is on the way and not being prepared is the worst kind of omission.

Todd Bianco Wed, Oct 26, 2016 at 9:17 am

My guess is this "concession" from Townscape was probably what they wanted in the first place. Propose something totally out of scale with no mitigation and then look like you're the "good guy developer" when they reduce the size and pay for some upgrades to the sewer and a cul-de-sac on Havenhurst – something that probably should or would have been required in the first place. $2.5 million to West Hollywood is nothing to Townscape and is a normal cost of doing business (remember, almost all of it is being spent to benefit their project).

It's the neighbors who will have to suffer for years as the infrastructure improvements and construction goes forward, then the decades of increasingly-bad traffic on Sunset and the surrounding streets.

I find it hard to believe that the designation of the Lytton Savings building as historic and worthy of saving, potentially incorporating it into the project, wouldn't be an important part of approving the project. I also don't buy Gehry's statement about the placement of the construction crane. And while he may not be interested in incorporating the bank building into the project, maybe an architect with an imaginative, more compatible vision for the site could do the job as well or better for less money. They don't need a starchitect for this project. What we are being shown is still just a sketch of "what could be."

Manny Thu, Oct 27, 2016 at 4:20 am

Todd Bianco nailed it!

Josh Kurpies Thu, Oct 27, 2016 at 6:59 am

I am disappointed to see a project of this magnitude result in only 16% of the units being affordable. (26 very-low, 12 moderate) In a project this size that has the capability of absorbing the costs to build the units by spreading it out over the entire project, we should expect, and demand, the developers meet at least 20% (I believe WeHo requires 20%) or even 30% (I believe LA Metro requires 30%)

I guess we can check this one off as another missed opportunity for the City of Los Angeles.

Steve Martin Thu, Oct 27, 2016 at 1:26 pm

Todd Bianco's instincts are pretty accurate. While I appreciate that the site is currently under utilized and is in need of revitalization, this mega project is simply completely over the top, even after these concessions. The "concessions" are not likely to represent meaningful mitigations to the traffic issues that will impact the Sunset Strip and Laurel Canyon, not to mention the West Hollywood residents of Havenhurst. Still I believe that Mayor Lauren Meister should be commended for her efforts. Fortunately both the Mayor and West Hollywood Community Development Director Stephanie De Wolf were vocal critics of Townscape's other project, 8899 Beverly Blvd. in West Hollywood. Given that three of our Council members have been the beneficiaries of thousands of dollars in campaign contributions from Townscape, it is unlikely that the entire City Council would have taken a hard line to oppose this project in closed session; so I believe we got the best deal possible under the convoluted political circumstances. It is funny how simple issues always get complicated once campaign contributions are part of the mix.

Andrew Macpherson Thu, Oct 27, 2016 at 2:37 pm

I would vigorously disagree with Todd. Having devoted years to fighting the original hideous cookie-cutter design as one of the founders of the neighborhood group Save Sunset Boulevard, I think a 'starchitect' is exactly what was needed.

Los Angeles is putting up so many hideous oversized steel framed boxes with no imagination that it is loosing it soul. As the entertainment capital of the world our city should and could rival Hong Kong, Dubai and Shanghai in its expressions of architectural imagination and excellence.

I live by, and directly overlook the site, which is why I supported the community fight against the original proposal. Townscape took on board our desire for something better, and came back with this vision project. Something big was going to bed built there, either by Townscape or someone else, I can say from my personal experience that that have done a great deal to work with us, and also I'm genuinely excited at the idea of revolutionary Gehry masterpiece rising in my view, and within easy walking distance.

Mike Dolan Thu, Oct 27, 2016 at 8:32 pm

Thank you Andrew Macpherson. I too am excited to see the final masterpiece, by Gehry, at 8150 Sunset Blvd.

I too, agree with Josh Kurpies, on the relative size of this project and the lack to achieve a higher % of affordable units. What happened to this element in "Weho Strikes a Deal..."

I'm puzzled with Councilmember Ryu strong recommendation to save the bank building but not to increase affordable units to at least 30%. I don't understand the priorities of this deal either from the City of Los Angeles nor the City of West Hollywood and its-

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DEAL??? I ask Councilmember Ryu to press further for real meaningful changes and demand more affordable units throughout this project.

The comment from Todd Bianco: "It's the neighbors who will have to suffer for years as the infrastructure improvements and construction goes forward," is like saying you must have this surgery to save your life. There will be a long recuperation but you will be better than before. Without this surgery (development), it's just a matter suffering and time.

Todd Bianco Fri, Oct 28, 2016 at 6:19 am

A couple of things. First, Frank Gehry isn't the only talented architect in Los Angeles. How about Zoltan Pali? There are many others who would kill for a chance to make a landmark project. I think Townscape is simply using Gehry's name to get an approval for a project that he may not end up designing. No one wants just another "modern" box with little visual interest. I'd rather have another PDC Red Building than another Avalon (Movietown Plaza) rabbit warren.

Second, there is always inconvenience, noise and other negative factors that go along with a major construction project. That's a given. Sure, we all are hoping for a good final result and a positive impact on the community. But the Sunset Strip has been a major construction zone for many, many years and there is a certain level of fatigue that goes with it. This project, if it's every built, will take years and years to finish. At least the hideous condos and decent-looking hotels on the south side of Sunset at La Cienega are nearing completion (finally). But how many other projects are either in construction, nearing construction or in planning that will annoy residents for the foreseeable future? None of those are going to be a subway, light rain or anything else to relieve traffic congestion.

SaveWeho Fri, Oct 28, 2016 at 12:57 pm

Yes...there were some missed opportunities here. I agree with Todd. Gehry isn't the only starchitect. I'm also EXTREMELY disappointed in the number of low income units. It should be at minimum 20-30%. But there is something else important with the low-income units. I'm discovering many dont include parking for those designated units. They assume the low income folks are too poor to own vehicles and will us public transportation. We also need to mandate that parking is required for EACH unit regardless of classification.

I get so disgusted with whoever is running the show. They make backhanded deals to cut this and that without truly thinking about the people and that these are their homes.

Mike Dolan Fri, Oct 28, 2016 at 3:45 pm

Development happens because the economy is good and that always benefits the people.

Yes, I agree, the construction during the improvement is a nuisance. All developments' have a beginning and end. Always the people are directly or indirectly the beneficiary and impacted during development. This has always been the reality in a high density area.

The people must spotlight deficiencies or additions that improve the development before construction to make the development optimum. The organic nature of a healthy economy and market forces will always prevail even if an individual would like to see no growth, low growth or influence the design of the development to their personal taste.

Recommendations can be good, yet if based in nostalgia or personal remembrances' and romanticizing times gone by, we neglect duty to plan for the future residents. In a small way we leave a legacy that will be created for the future constituents of West Hollywood.

There is no one person or group that conspires or colludes to annoy the 'people'. The reality is unseen forces of a healthy economy filling the needs of our area and the desirability to do business, live, work and play in West Hollywood.

Development Woes Fri, Oct 28, 2016 at 3:45 pm

This was not a project that required Frank Grhry or any architect in the so called "upper echelons". An architect sensitive to the surrounding area both LA and WH would easily have been able to act upon inspiration from the Lytton Savings Bank and design an interesting and respectful project . Although Kurt Meyers design might not be my personal fave I recognize his excellence and representation of an important era and rightful place in the architectural language and fabric of LA.

The problem here was a development team with a bloated sense of reality in both their behavior and in their choice of architects. In a blind tasting of project designs from worthy architects I don't believe they could make a qualified choice. Their goal was getting to the. Iggest chunk of revenue asap. Their foxy ways determined that acquiring Gehry would allow them to exceed the speed limit and bypass all the normal sensible constraints, the purpose of a planning process to begin with. In some respects. Gehry being the obstructionist that he is, be it projects or disruption in his own home neighborhood was the perfect choice for Townscape.

West Hollywood didn't put out an RFP for a Gateway Project to compromise their valued landmark buildings or historic neighborhood. Could this have been a collaborative project given the adjacent municipal disposition? Perhaps, that would have been a true indication of progress and awareness. Next time you drive past Disney Hall remember that 8150 Sunset will be bigger with less logistical consideration.

Development Woes Fri, Oct 28, 2016 at 4:53 pm

Actually, now that I commented on bloated sensibilities, I recall that is the unfortunate affliction of Townscape's Beverly Blvd project.

Time to build interesting projects in a straightforward manner. Too simple? Some folks seem to love drama and posturing. That burns up too much time and $$$$$.

Mike Dolan Fri, Oct 28, 2016 at 6:56 pm

@Development Woes, your statement, "An architect sensitive to the surrounding area both LA and WH would easily have been able to act upon inspiration from the Lytton Savings Bank and design an interesting and respectful project." Is representative of the time.

I would not ever compare personally Lytton Savings Band and Kurt Meyer's to Frank Gehry. Both highly respected for their contributions; Meyer's, in my opinion, does not stand the test of time. Like Frank Lloyd Wright and Gehry possess that quality. However, I'm sure Meyer's designs were a welcome, new and creative architectural direction that was quite different at its time and style of architecture to our area.

My personal excitement for the Gehry proposal is that it is a creative, new and fascinating direction for the border of West Hollywood, Los Angeles and our own Sunset strip. In fact, I was at the Dorothy Chandler Pavilion on Thursday and every time I see the L.A. Philharmonic Disney Concert Hall, I always wished and wondered why on Sunset Strip something like, what now is designed by Gehry, could not be and become for future generations to admire as a landmark on this important intersection to our area.

Last, I am not commenting on behalf of Townscape. It could be ABC Developer for all I care. It is the benefit of the Gehry design, the economic positive impact to Los Angeles, West Hollywood and the Sunset Strip. I believe that there are some kinks to be worked out and in the end compromise will prevail for benefit of the current and future residents and users of our Sunset Strip.

Gehry has designed the next iconic landmark. Not for yesteryear but for tomorrow-land.

Development Woes Sat, Oct 29, 2016 at 11:02 am

@ Mike Dolan: BTW FOG has already left an imprint on Sunset Blvd. Have you missed it?

Development Woes Sun, Oct 30, 2016 at 10:07 am

@ Steve Martin: Being a vocal critic about Townscape's Beverly Blvd. project and collapsing in the home stretch proved that one has no real heart and substance. When an individual's "prized commitments" were represented as development and transportation issues this indicates a major fail. Euphemistic campaign wishes and dreams do not automatically translate into action especially when negotiation is clearly beyond one's scope. Blind Sided in the home stretch with no concept of all the moving parts.

Development Woes Sun, Oct 30, 2016 at 10:25 am

& Mike Dolan: Two of the architects that designed buildings in immediate proximity to 8150 Sunset have nearly every building designed recognized as a landmark. Some have multiply designations ....National, State and Local. The Zweibel's known for their exquisite courtyard buildings and Leland Bryant whose study of the great chateaux of the Loire Valley and a riff on Art Deco inspired by the Paris Exposition resulted in countless elegant buildings in West Hollywood, Hollywood and Los Angeles. This seems of no material consideration to the disrupter team of Townscape & Gehry. One can never project their place in the annals of excellence or the ashcan.

It is also fair to say that while Townscape/Gehry team sat in the council chamber proceedings at City Hall last Tuesday they were oblivious to the magnificent John Parkinson/ A.C. Martin building whose every nik and cranny contribute to an enduring masterpiece in a location befitting its grandeur.

Leave a Comment

Exhibit 2

2016

NON EMS | EMS

TURN OUT	TRAVEL	NUMBER OF INCIDENTS
01 MINS 05 SECS	04 MINS 38 SECS	2992

STATION 41 RESPONSE METRICS, JANUARY - SEPTEMBER 2016

NON EMS | EMS

TURN OUT	TRAVEL	NUMBER OF INCIDENTS
01 MINS 07 SECS	05 MINS 14 SECS	724

STATION 41 RESPONSE METRICS, JANUARY - SEPTEMBER 2016

NON EMS | EMS

CALL PROCESSING	TURN OUT	TRAVEL
01 MINS 03 SECS	01 MINS 04 SECS	04 MINS 20 SECS

CITY WIDE RESPONSE METRICS, JANUARY - SEPTEMBER 2016

NON EMS | EMS

CALL PROCESSING	TURN OUT	TRAVEL
01 MINS 03 SECS	01 MINS 04 SECS	04 MINS 14 SECS

CITY WIDE RESPONSE METRICS, JANUARY - SEPTEMBER 2016

2015

NON EMS | EMS | De Longpre Ave | ArcLight Hollywo

TURN OUT	TRAVEL	NUMBER OF INCIDENTS
01 MINS 16 SECS	04 MINS 20 SECS	3860

STATION 41 RESPONSE METRICS, JANUARY - DECEMBER 2015

NON EMS | EMS | De Longpre Ave | ArcLight Hollywo

TURN OUT	TRAVEL	NUMBER OF INCIDENTS
01 MINS 14 SECS	05 MINS 06 SECS	1114

STATION 41 RESPONSE METRICS, JANUARY - DECEMBER 2015

NON EMS | EMS | Santa M

CALL PROCESSING	TURN OUT	TRAVEL
01 MINS 03 SECS	01 MINS 12 SECS	04 MINS 11 SECS

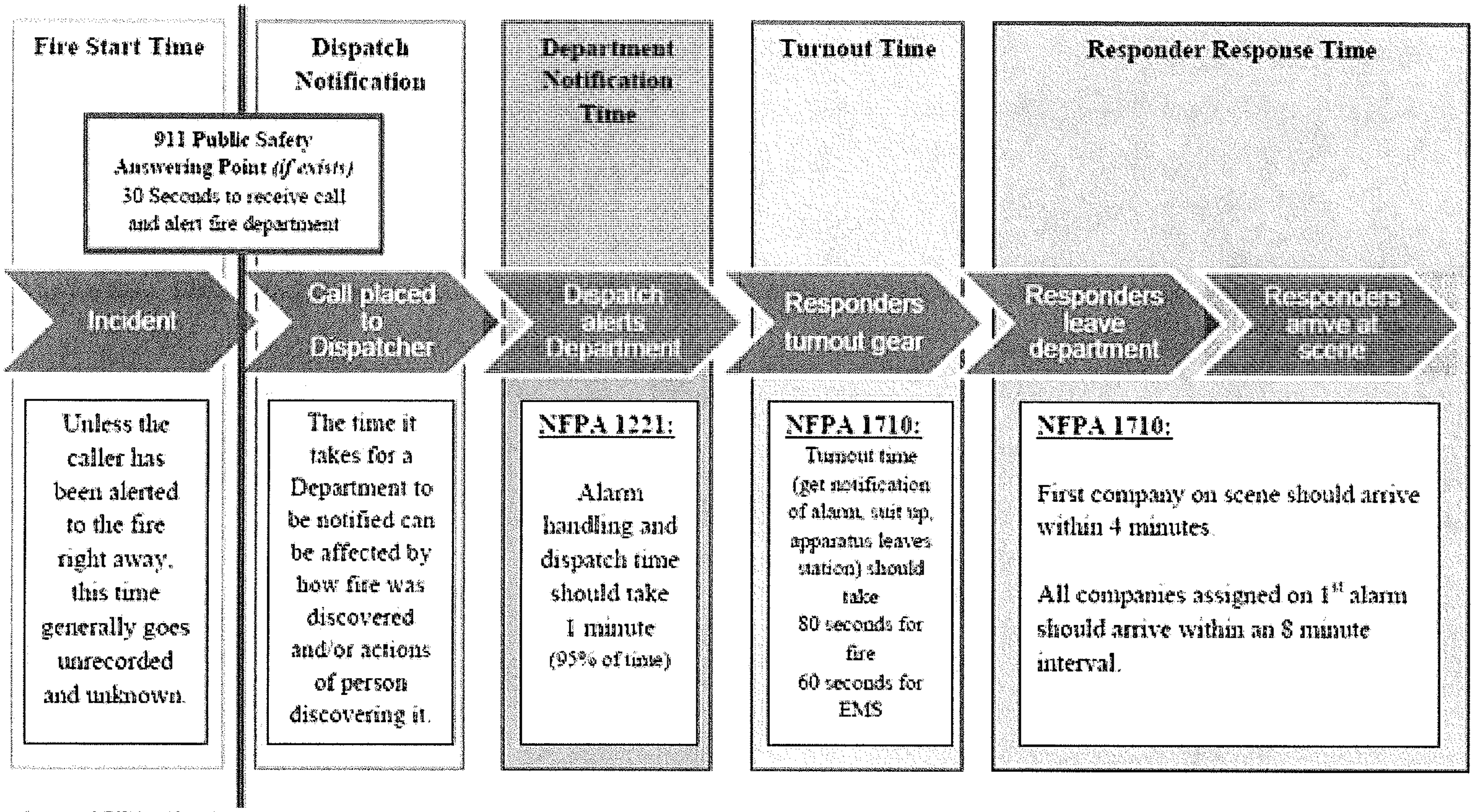
CITY WIDE RESPONSE METRICS, JANUARY - DECEMBER 2015

NON EMS | EMS | Santa M

CALL PROCESSING	TURN OUT	TRAVEL
01 MINS 03 SECS	01 MINS 11 SECS	04 MINS 11 SECS

CITY WIDE RESPONSE METRICS, JANUARY - DECEMBER 2015

Figure 2. Incident Development and Response Timeline and NFPA 1221 and 1710 Recommendations for Career Firefighters



Source: NFPA 1221: *Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems* and NFPA: 1710 *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments.*

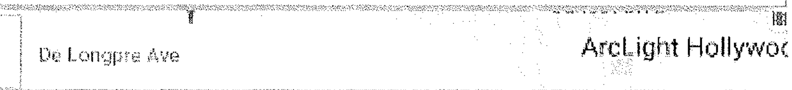
2014

NON EMS | EMS

TURN OUT	TRAVEL	NUMBER OF INCIDENTS
01 MINS 10 SECS	04 MINS 28 SECS	3390

STATION 41 RESPONSE METRICS, JANUARY - DECEMBER 2014

NON EMS | EMS



TURN OUT	TRAVEL	NUMBER OF INCIDENTS
01 MINS 08 SECS	05 MINS 09 SECS	997

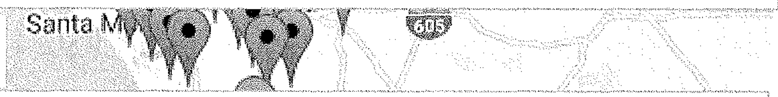
STATION 41 RESPONSE METRICS, JANUARY - DECEMBER 2014

NON EMS | EMS

CALL PROCESSING	TURN OUT	TRAVEL
01 MINS 15 SECS	01 MINS 14 SECS	04 MINS 05 SECS

CITY WIDE RESPONSE METRICS, JANUARY - DECEMBER 2014

NON EMS | EMS



CALL PROCESSING	TURN OUT	TRAVEL
01 MINS 15 SECS	01 MINS 13 SECS	04 MINS 11 SECS

CITY WIDE RESPONSE METRICS, JANUARY - DECEMBER 2014

2013

NON EMS | EMS | De Longpre Ave | ArcLight Hollywoo

TURN OUT	TRAVEL	NUMBER OF INCIDENTS
01 MINS 18 SECS	04 MINS 18 SECS	3381

STATION 41 RESPONSE METRICS, JANUARY - DECEMBER 2013

NON EMS | EMS | De Longpre Ave | ArcLight Hollywoo

TURN OUT	TRAVEL	NUMBER OF INCIDENTS
01 MINS 11 SECS	04 MINS 52 SECS	970

STATION 41 RESPONSE METRICS, JANUARY - DECEMBER 2013

NON EMS | EMS | Santa M | 605

CALL PROCESSING	TURN OUT	TRAVEL
01 MINS 17 SECS	01 MINS 15 SECS	04 MINS 01 SECS

CITY WIDE RESPONSE METRICS, JANUARY - DECEMBER 2013

NON EMS | EMS | Santa M | 605

CALL PROCESSING	TURN OUT	TRAVEL
01 MINS 17 SECS	01 MINS 12 SECS	04 MINS 06 SECS

CITY WIDE RESPONSE METRICS, JANUARY - DECEMBER 2013

FTC NFPA 1710 (90% within five minutes) Times Based On LAFD Raw Data

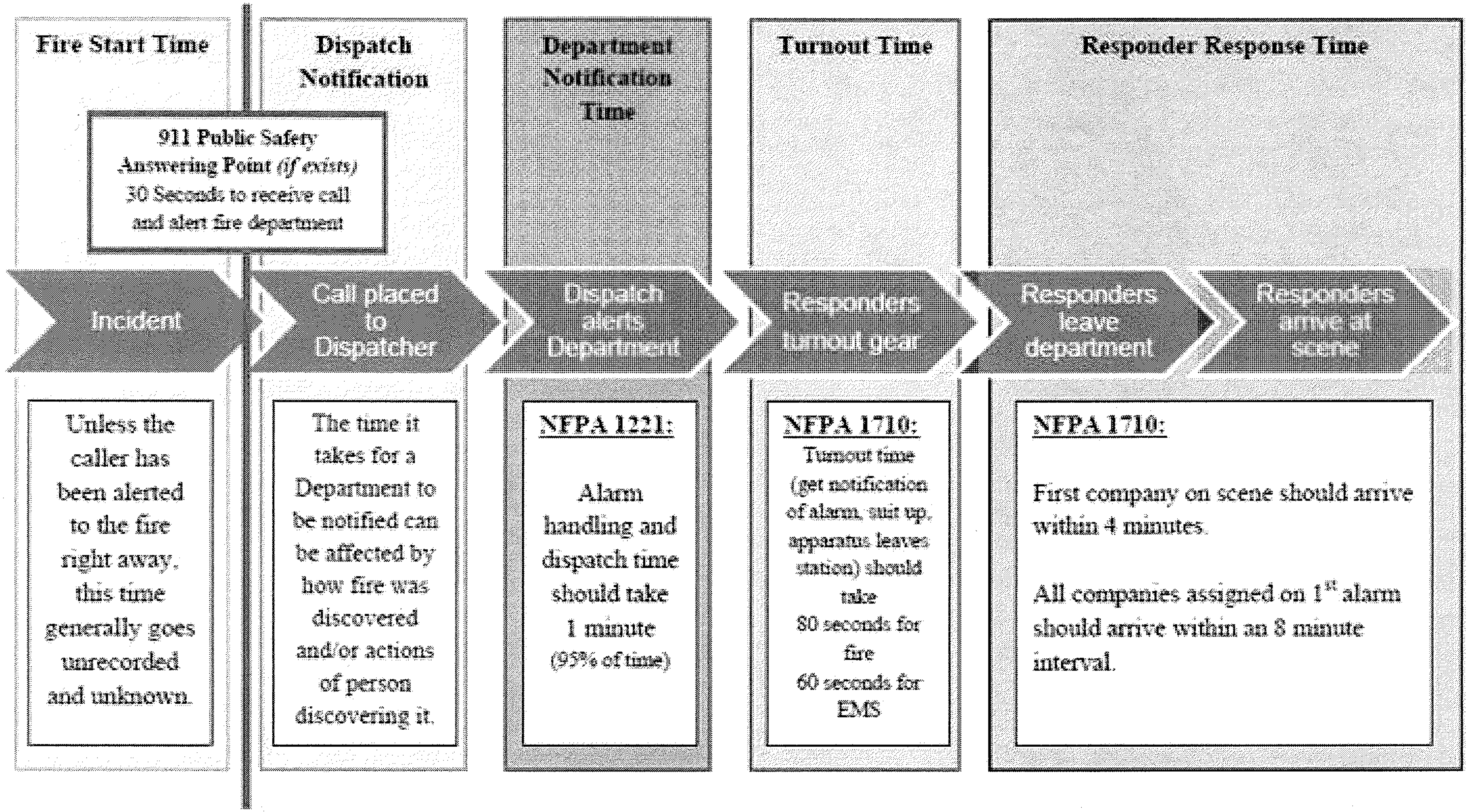
0	28.26%
1	51.80%
2	67.02%
3	66.39%
4	60.99%
5	39.34%
6	73.73%
7	58.57%
8	39.26%
9	78.75%
10	69.56%
11	83.23%
12	70.26%
13	73.04%
14	81.32%
15	72.21%
16	41.03%
17	66.36%
18	47.13%
19	37.49%
20	66.67%
21	68.55%
23	45.01%
24	47.23%
25	54.64%
26	66.24%
27	62.58%
28	49.05%
29	66.76%
33	61.64%
34	53.29%
35	73.82%
36	57.72%
37	53.50%
38	67.34%
39	60.14%
40	38.11%
41	53.01%
42	67.67%
43	66.67%
44	51.53%
46	59.36%
47	55.96%
48	71.52%
49	42.89%
50	53.64%
51	36.50%
52	67.64%
55	64.34%
56	46.49%
57	56.90%
58	49.91%
59	56.04%
60	62.10%
61	52.37%
62	48.58%
63	49.28%
64	60.47%

65	50.91%
66	50.67%
67	41.13%
68	57.80%
69	37.71%
70	53.79%
71	45.35%
72	60.54%
73	66.36%
74	53.62%
75	56.40%
76	41.26%
77	38.54%
78	51.53%
79	29.74%
81	48.16%
82	69.86%
83	45.41%
84	47.39%
85	56.51%
86	70.65%
87	63.94%
88	55.56%
89	46.86%
90	41.44%
91	40.23%
92	49.48%
93	64.14%
94	59.35%
95	61.17%
96	43.36%
97	35.02%
98	50.42%
99	40.67%
100	60.34%
101	61.04%
102	57.58%
103	61.99%
104	72.88%
105	49.66%
106	58.69%
107	73.98%
108	17.46%
109	15.81%
112	81.28%
Grand Total	58.69%

At the December 4, 2012 City Council meeting, ITEM NO. (19) relating to the LA Times story dealing with EMS response Times, Patrick I. Butler, Assistant Chief Special Operations Division gave a verbal Preliminary Report for the TASK FORCE ON INFORMATION AND DATA ANALYSIS. He stated clearly that "there is an issue with using averages because they overlook outliers. He stated that "if you are an outlier you want to make sure your response is on time. That is why we use the 90% figure."

Action/Time Point	Data provided by LAFD	Standard	Description/Misc.
Incident occurs			No way to know how much time has transpired between the actual emergency and the call to 911. This is out of the control of the City.
Person places 911 call			Call is routed to either LAPD or CHP as the Primary Public Safety Point.
Wait time until PRIMARY public safety point answers (LAPD, CHP, LACO)		Not tracked by LAFD	LAPD is supposed to have 900 call takers but apparently only has 450 now due to cuts.
Interaction with Primary PPSP		Not tracked by LAFD	Determination of police v. fire or other response needed.
PPSP sends to LAFD		Not tracked by LAFD	
LAFD delay until pick-up		Not tracked by LAFD	If all dispatchers are busy on ANY TYPE of call, the PPSP must wait with the caller.
LAFD answers	INITIAL_911_TIME	60 seconds for fire 90 seconds for EMS 90% of the time (NFPA 1221) (Current records show this is at 113 seconds. % success not calculated yet)	
Call type determination (EMS/Fire)			
Create Incident	CREATION_TIME		
Get Incident (from the system)	GET_TIME		
Determine incident details			
Time required for dispatch	PEND_TIME		Immediate via DVS2, delayed via DVS1
Dispatch (via DVS2)	DISPATCH_TIME		DVS2: Units are automatically dispatched via automated voice systems immediately after dispatch. DVS1: The dispatch does not happen until it is manually reviewed, often due to resource depletion in an area of the City.
Turnout Time		1 minute turnout, 4 minutes response (5 minute response time) (NFPA1717)	
Response Time			
Arrival On Scene (first resource)	ONSCENE_TIME		Apparently FFs hit the OnScene button usually 30-60 seconds BEFORE actual arrival in preparation for arriving.
Time To Patient		Tracked but not provided via CPRAs	Not reported to us (apparently often 1-2 minutes) Available to them via EPCR (handheld devices) TTP is the time it takes to get to the patient once the FFs stop the rig.
Arrival On Scene (all resources)			The 1st resource on scene may not be the unit type that is needed (engine v. rescue).
Patient transported	TSP_TIME		Includes treatment time on scene, plus wait for transport if first responder was not a transport.
Arrival at the hospital	HSP_TIME		Includes traffic time, distance to nearest ER.
Incident complete/unit available	END_TIME		Includes time waiting at the hospital to clear the patient, resupply.

Figure 2. Incident Development and Response Timeline and NFPA 1221 and 1710 Recommendations for Career Firefighters

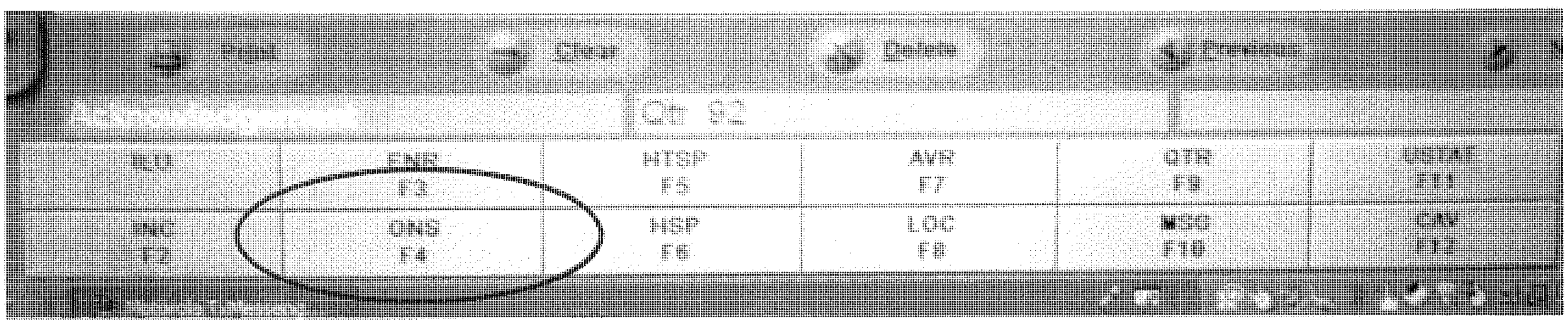


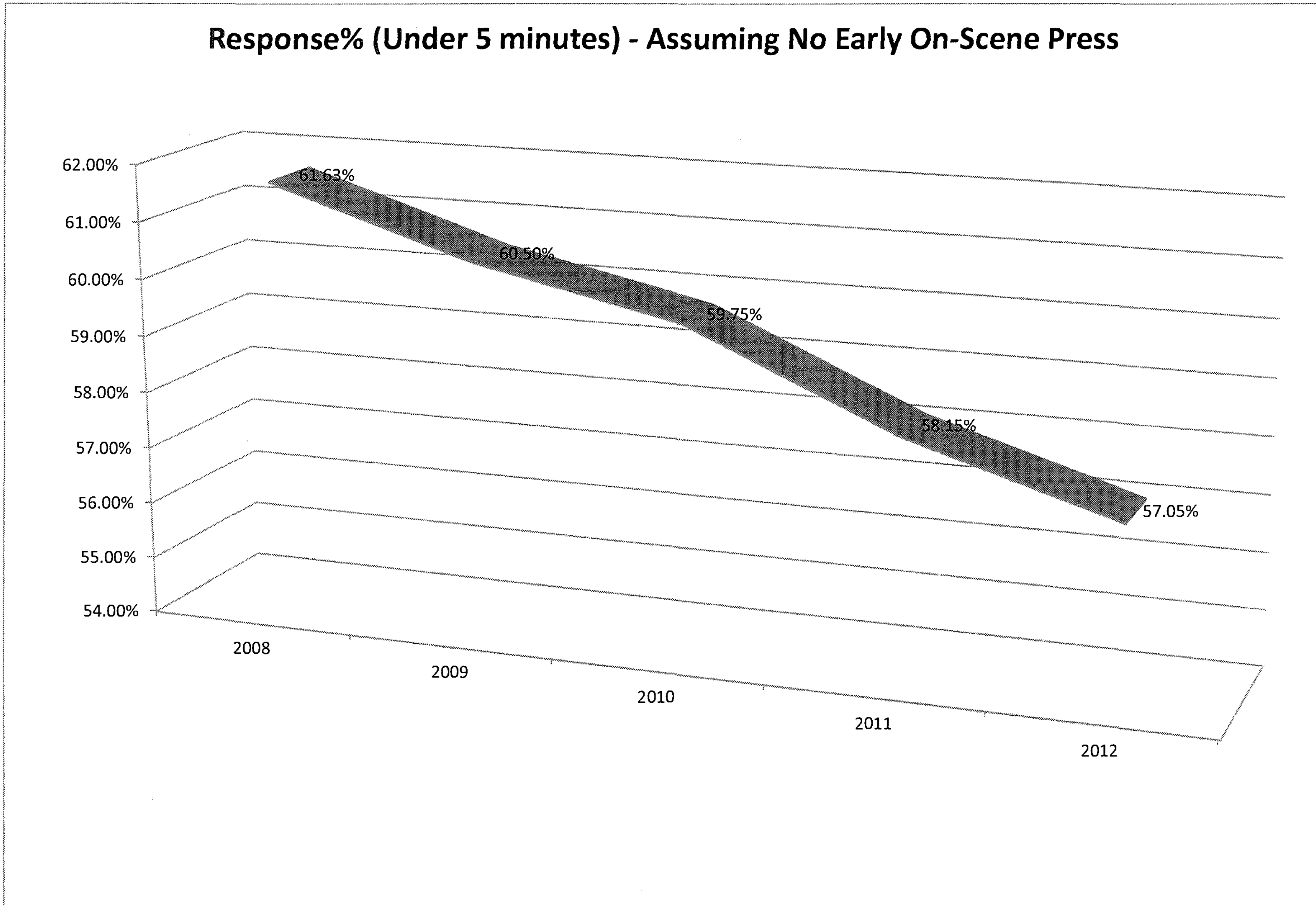
Source: NFPA 1221: *Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems* and NFPA: 1710 *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments.*

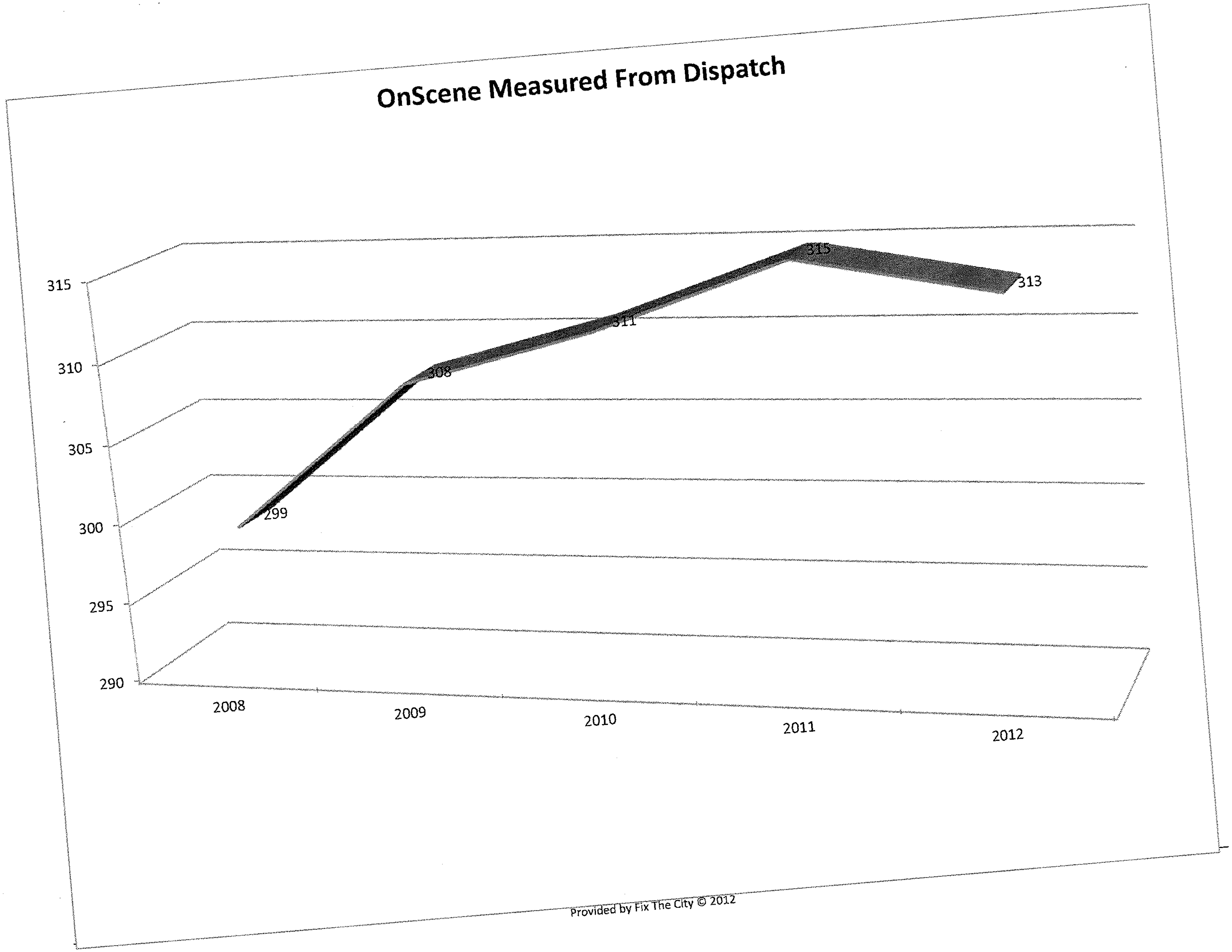
Response Percentages Over Time

	On-Scene%	10 Sec Early	30 Sec Early	60 Sec Early
2007	64.94%	57.96%	54.34%	42.32%
2008	61.64%	54.45%	50.65%	38.49%
2009	60.52%	53.64%	49.85%	37.81%
2010	59.75%	51.91%	49.00%	37.11%
2011	58.13%	49.98%	47.02%	34.97%
2012	57.05%	49.46%	45.61%	33.73%

Firefighters press the "On Scene" button between 10 and 60 seconds before the truck stops as they get ready to deploy. This early press ends the "5-minute" response time period. This results in the appearance of better response times. The chart above shows response time percentages as reported, and with 10, 30 and 60 second "early presses" calculated.




Response% (Under 5 minutes) - Assuming No Early On-Scene Press
62.00%
61.00%
60.00%
59.00%
58.00%
57.00%
56.00%
55.00%
54.00%
61.63%
60.50%
59.75%
58.15%
57.05%
2008
2009
2010
2011
2012



OnScene Measured From Dispatch
315
310
305
300
295
290
299
308
311
315
313
2008
2009
2010
2011
2012
Provided by Fix The City © 2012

Definition of Response Time

The definition of "response time" depends on the perspective from which one approaches the data. In the fire service, "total" response time is usually measured from the time a call is received by the emergency communications center to the arrival of the first apparatus at the scene. For the public, the clock for response time begins when the public becomes aware there is an emergency incident occurring and the fire department is notified. In reality, however, the response time clock for fire suppression begins at the moment of fire ignition and continues until the fire is extinguished.

Response Time Components

Response time components include ignition, combustion, discovery, 911 activation,[1] call processing and dispatch, turnout time, drive time, setup time, "vertical" response, combat, and extinguishment (Figure 1).

Fire *ignition* occurs when oxygen, fuel, and heat combine to produce flame. *Combustion* is a self-sustaining chemical reaction yielding energy or products that cause further reactions of the same kind.[2] Depending on the available fuel load and other conditions, a fire may grow undetected for some time prior to being detected. *Discovery* or detection occurs when someone becomes aware of the fire and takes steps to mitigate the situation (e.g., calls the fire department, uses a fire extinguisher). Depending on whether or not one tries to extinguish the fire, 911 *activation* may occur several minutes after the fire is detected. In the case of an incendiary or suspicious fire (or other criminal firesetting act), this activation might be postponed deliberately.

Once 911 has been activated, *call processing and dispatch* is the time it takes for the 911 operator to ascertain the location and type of incident and alert the appropriate emergency service providers to the emergency.

Turnout time is measured from the time the alarm is received by firefighting personnel to the time the appropriate apparatus begins its actual driving response to the scene. Turnout time comprises getting to the station (in most volunteer organizations), donning protective gear, and other preparatory activities.

Drive time is the time it takes to drive from the fire station (or location that received the alarm) to curbside of the address of the incident.

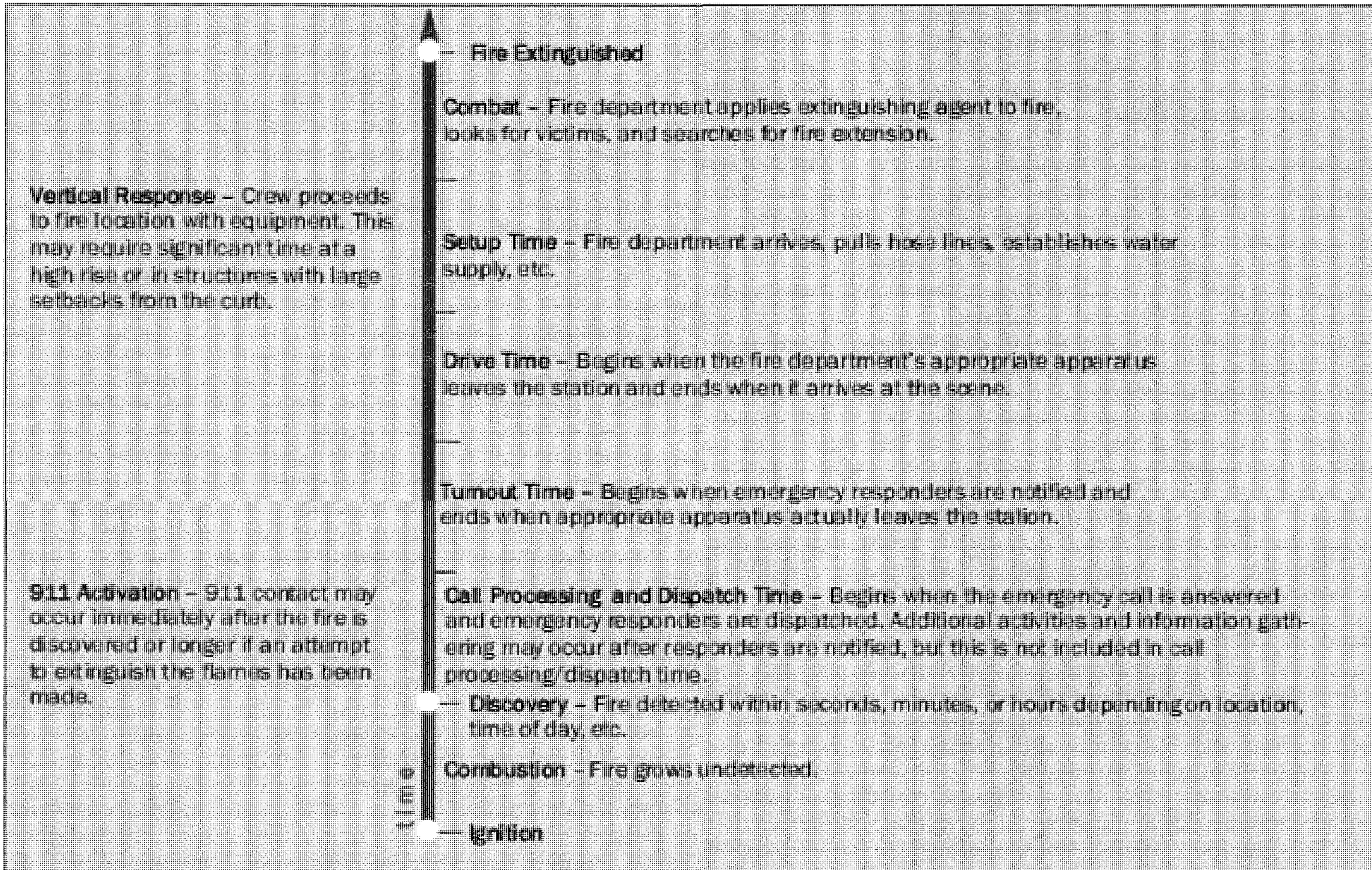


FIGURE 1. COMPONENTS OF TOTAL RESPONSE TIME

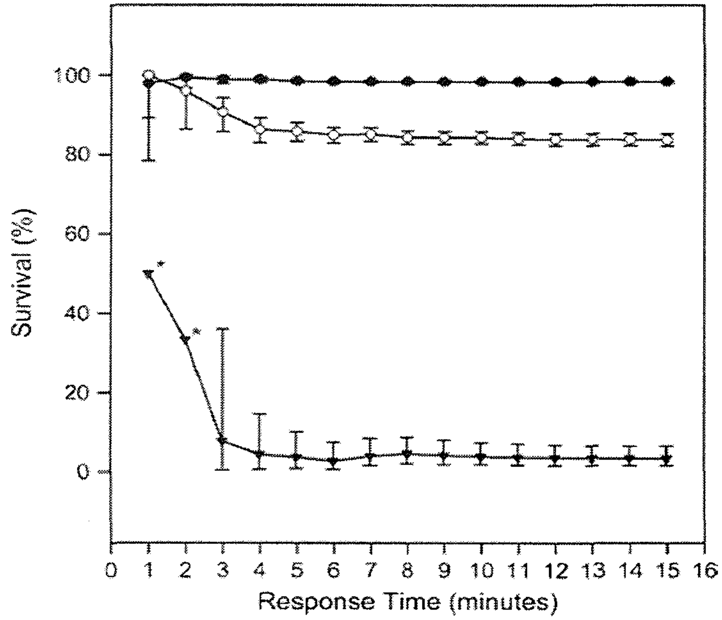
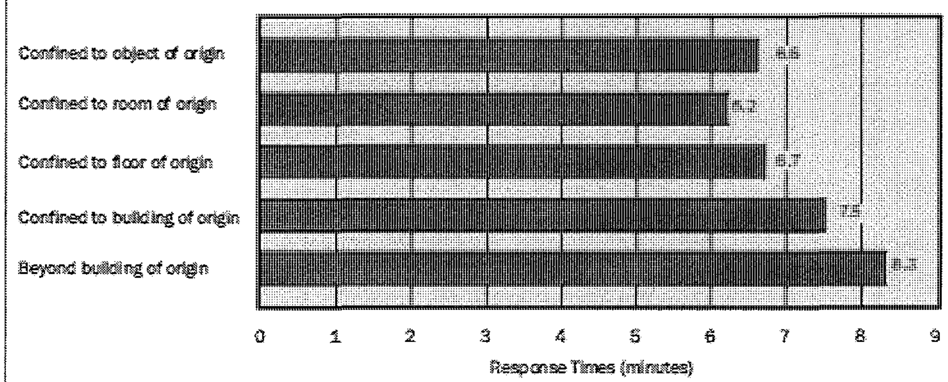


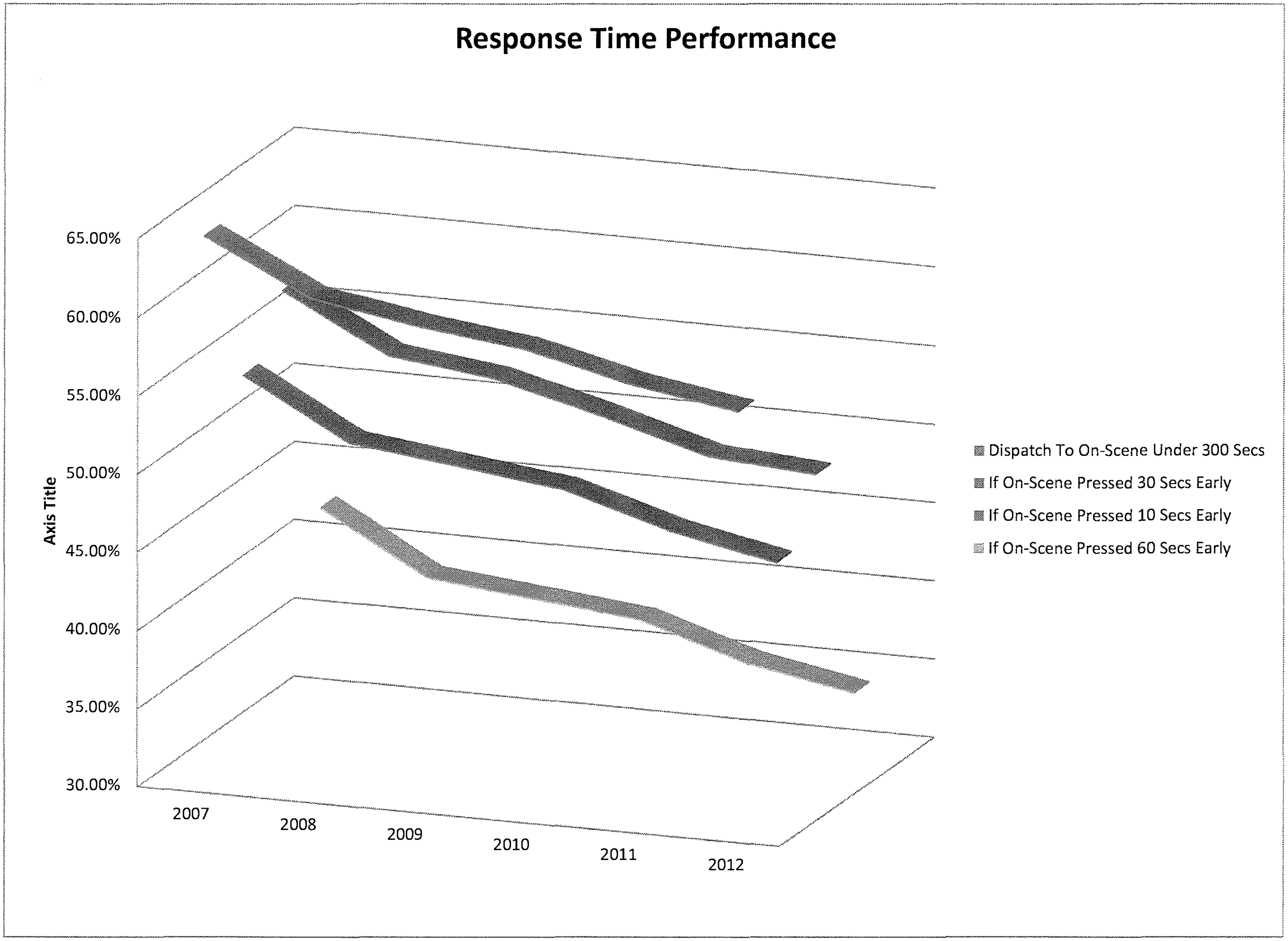
Figure 1. Percentages of survival to hospital discharge by paramedic response time and stratified by risk groups (bars represent 95% CIs). All patients were categorized into low-risk (●), intermediate-risk (○), or high-risk (▼) groups. The high-risk group included all traumatic and nontraumatic cardiac arrest patients. The intermediate-risk group included all suicide attempts, accidental exposures, unconscious patients, those with penetrating trauma, those with respiratory complaints, and those who were hypotensive in the out-of-hospital setting. All other patients were grouped into the low-risk category. *CIs were not calculated for these response times due to sparse data.

FIGURE 5. MEAN RESPONSE TIMES VS. FLAME SPREAD

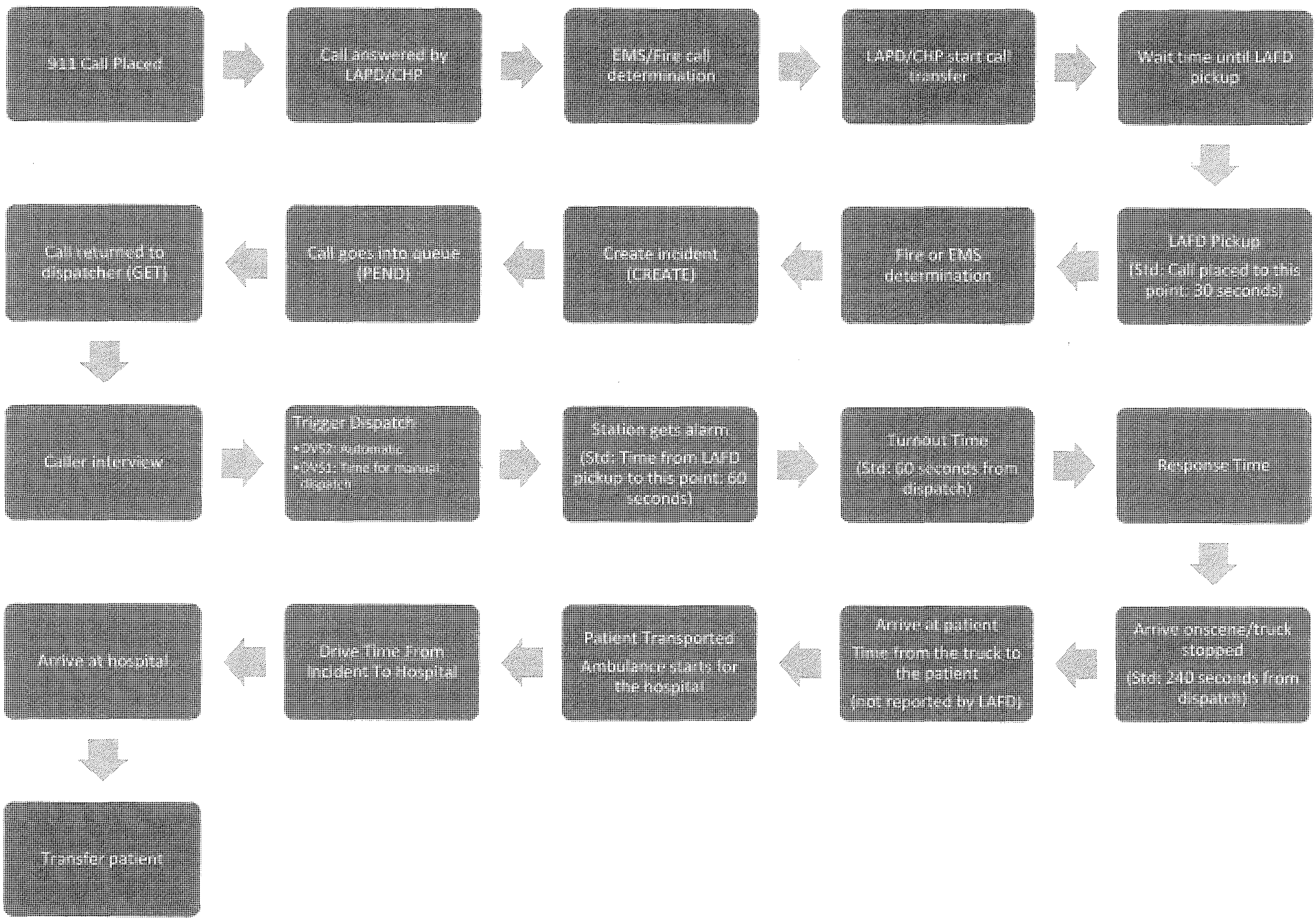


Response times here are measured from dispatch time to arrival on scene
http://www.usfa.fema.gov/downloads/pdf/statistics/v5i7.pdf

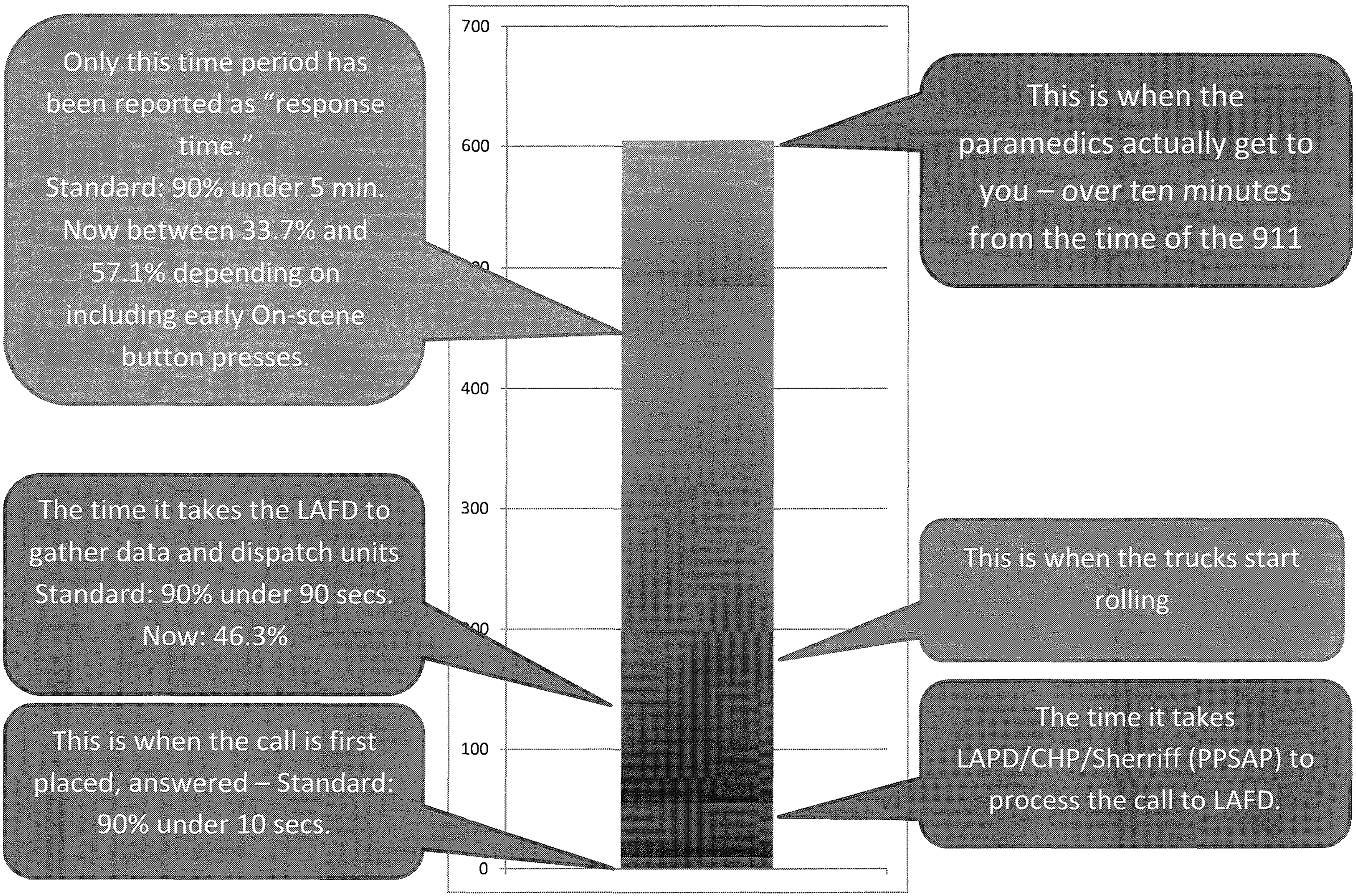
Pons, P. T., Haukoos, J. S., Bludworth, W., Cribley, T., Pons, K. A., & Markovchick, V. J. (2005). Paramedic response time: does it affect patient survival? *Academic emergency medicine official journal of the Society for Academic Emergency Medicine*, *12* (7), 594-600. Wiley Online Library. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/15995089



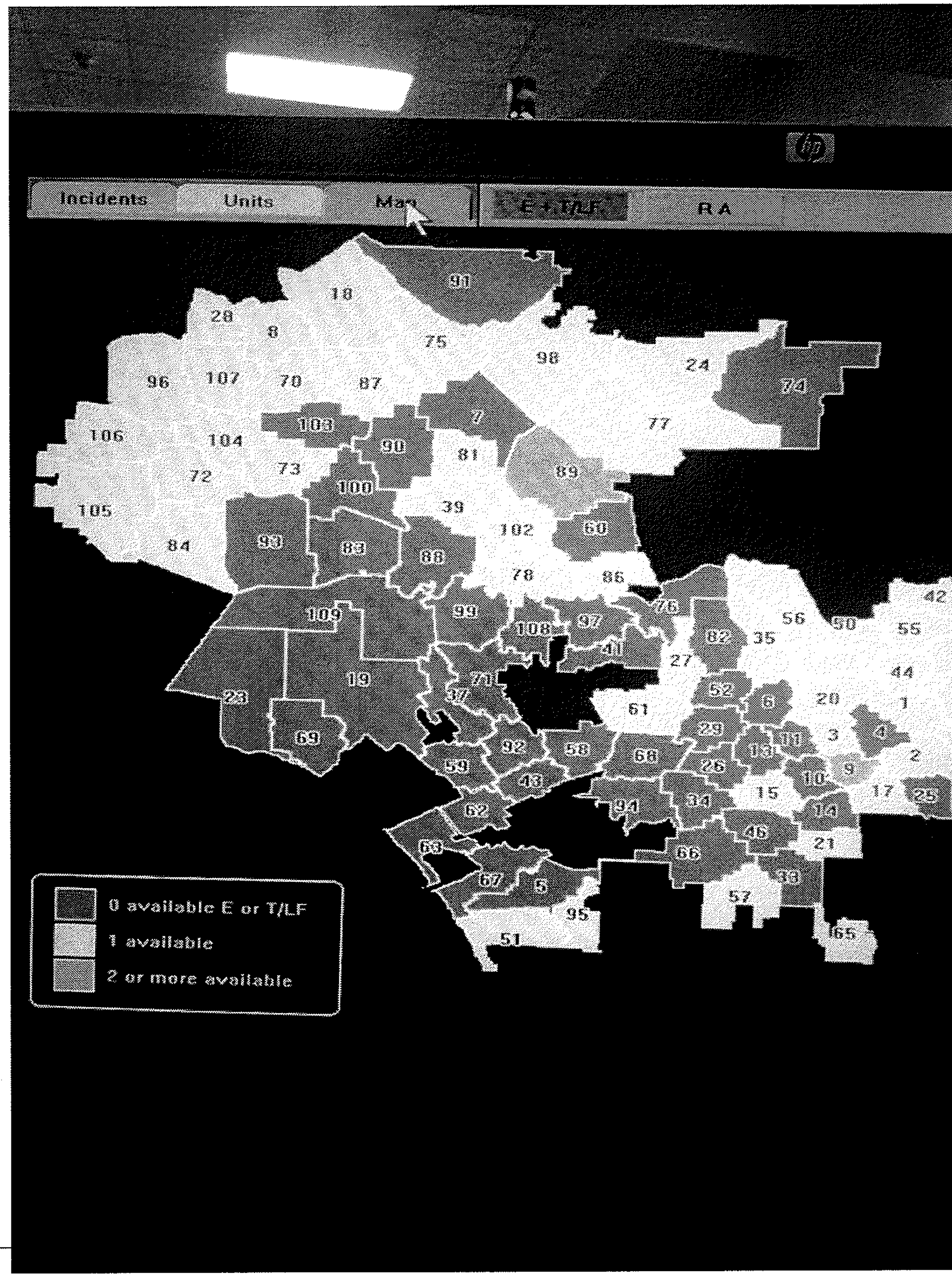
Response Time Performance
65.00%
60.00%
55.00%
50.00%
45.00%
40.00%
35.00%
30.00%
Axis Title
2007
2008
2009
2010
2011
2012
Dispatch To On-Scene Under 300 Secs
If On-Scene Pressed 30 Secs Early
If On-Scene Pressed 10 Secs Early
If On-Scene Pressed 60 Secs Early

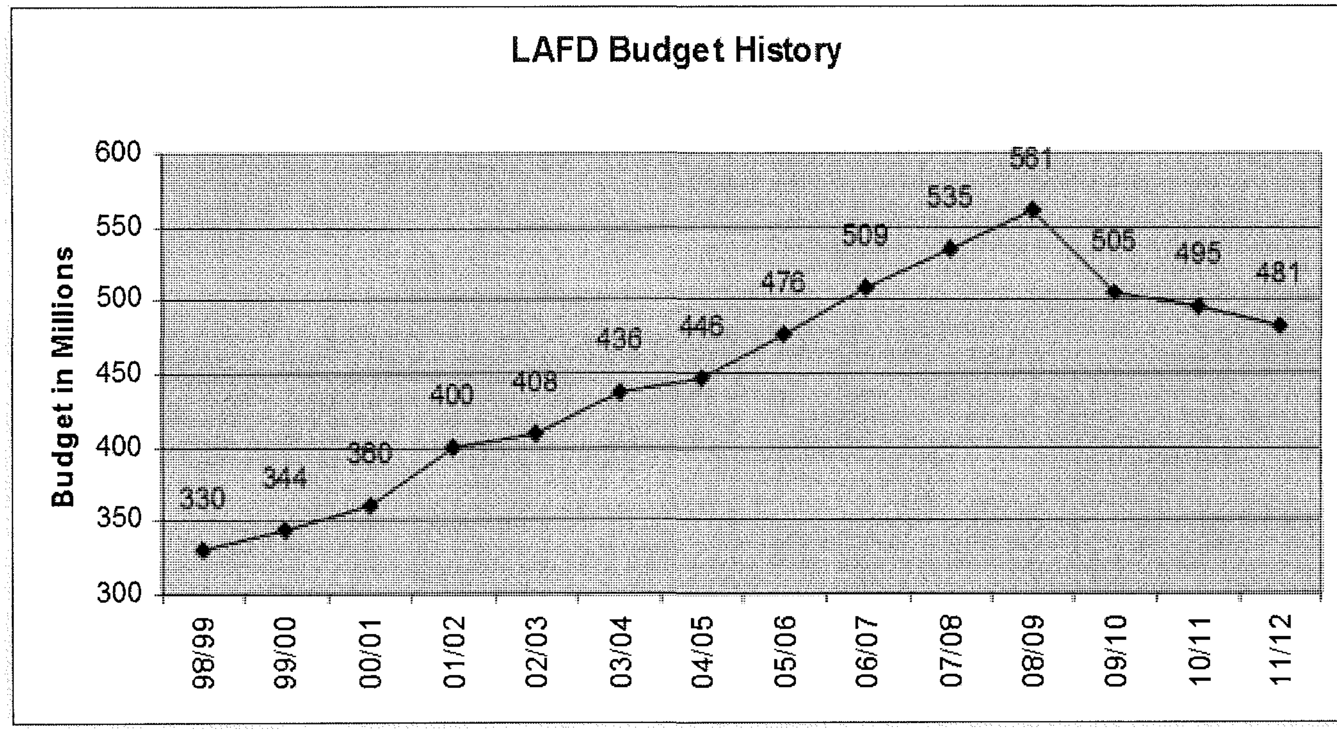

911 Call Placed
Call answered by LAPD/CHP
EMS/Fire call determination
LAPD/CHP start call transfer
Wait time until LAFD pickup
LAFD Pickup
(Std: Call placed to this point: 30 seconds)
Fire or EMS determination
Create incident (CREATE)
Call goes into queue (PEND)
Call returned to dispatcher (GET)
Caller interview
Trigger Dispatch:
• EMS2: Automatic
• EMS1: Time for manual dispatch
Station gets alarm
(Std: Time from LAFD pickup to this point: 60 seconds)
Turnout Time
(Std: 60 seconds from dispatch)
Response Time
Arrive onscene/truck stopped
(Std: 240 seconds from dispatch)
Arrive at patient
Time from the truck to the patient
(not reported by LAFD)
Patient Transported
Ambulance starts for the hospital
Drive Time From Incident To Hospital
Arrive at hospital
Transfer patient

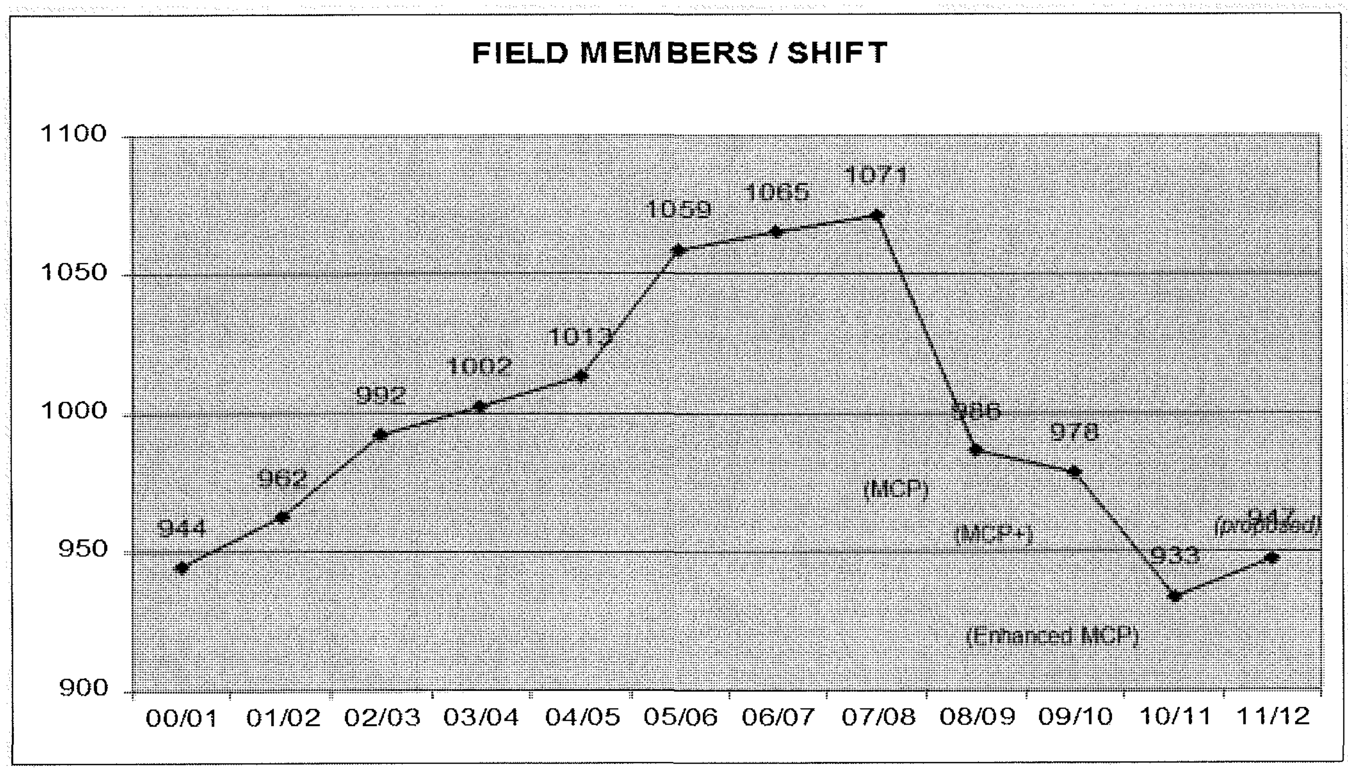
Anatomy of a 911 Call




0 available RA
1 available
2 or more available
SHARP
44

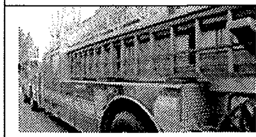
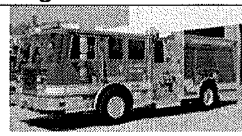
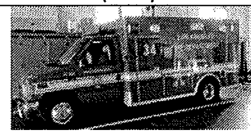
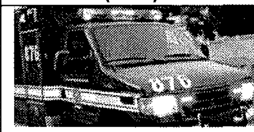
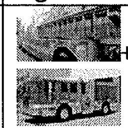

Incidents
Units
Map
E + T/LF
R A
0 available E or T/LF
1 available
2 or more available


LAFD Budget History
Budget in Millions
600
550
500
450
400
350
300
330
344
360
400
408
436
446
476
509
535
561
505
495
481
98/99
99/00
00/01
01/02
02/03
03/04
04/05
05/06
06/07
07/08
08/09
09/10
10/11
11/12


FIELD MEMBERS / SHIFT
1100
1050
1000
950
900
944
962
992
1002
1013
1059
1065
1071
986
978
933
947
(proposed)
(MCP)
(MCP+)
(Enhanced MCP)
00/01
01/02
02/03
03/04
04/05
05/06
06/07
07/08
08/09
09/10
10/11
11/12

LAFD At A Glance

Key LAFD Apparatus

Truck	Engine	Rescue (ALS)	Rescue (BLS)	Light Force
				
Staffed by 5 FFs	Staffed by 4 FFs	Paramedic/FF Staffed	EMT/FF Staffed	Truck+Engine

Why five in a truck: The Engineer is responsible for pumping water. One firefighter is responsible for cutting utilities (gas/electrical) then joins the ventilation team. One firefighter ladders the roof and heads up as the ace man on the ventilation team. One firefighter is responsible for forcible entry (doors/windows) and pulling down the ceiling so that ventilation works. An Apparatus Operator drives then operates the ladder and leads the ventilation team with a chain saw. A Captain acts as incident commander until a Chief arrives – The captain then heads to the roof as the Safety Man. (Light force has 6 total firefighters – 5 truck, 1 engine)

EMT(BLS) v. Paramedic(ALS): EMT training: 120-150hrs. Paramedic training: 1,200-1,800 hrs. EMT skills: CPR, giving oxygen. EMTs are not allowed to provide treatments that requiring breaking the skin: that means no needles. **Paramedics** are advanced providers of emergency medical care and are highly educated in topics such as anatomy and physiology, cardiology, medications, administering medications, starting intravenous lines, providing advanced airway management for patients, and learning to resuscitate and support patients with significant

Key Terms

- **PPSAP – Primary Public Safety Access Point.** This is where 911 calls are first answered. In L.A., this is the LAPD, CHP or Sheriff. Calls must be answered in 10 seconds, 90% of the time.
- **SPSAP – Secondary Public Safety Access Point** The LAFD is a SPSAP as it receives 911 calls from law enforcement (as the primary). Calls must be answered in 10 seconds, 90% of the time.
- **ALS – Advanced Life Support** (paramedic ambulance)
- **BLS – Basic Life Support** (EMT-staffed ambulance)

Deployment Milestones

Constant Staffing: Mandatory overtime program to save the City money because one firefighter working overtime is less expensive than two firefighters with pensions.

Modified Coverage Plan: A rotating system of "brown-outs" which resulted in increasingly poor response metrics.

Deployment Plan: Supposed to improve response times using "new software." Actual response times worsened due to company closures.

How to Measure LAFD Performance

Category	Standard	2011
Time from 911 Call to LAFD Call Ctr		
Time from 911 Call to Dispatch	90% < 90Sec	43.1%
Time from Dispatch to On Scene	90% < 300Sec	57.1%
Time from On Scene to Patient		120s
Time from Patient to Transport		TBD
Time from Transport to Hospital		TBD
Injuries On Duty		TBD
Structures Saved		TBD
Survival% for Patients		TBD

Steps In A 911 Call

Event	Standard	Actual
Person Calls 911		
LAPD/CHP Answers	90% < 10 sec	10 secs*
Call Handling	TBD	30 secs*
Call Handoff to LAFD	90% < 10 sec	15 secs*
LAFD Dispatch	60s(Fire) 90s(Ems)	117 secs
Turnout+Response	90% < 300 sec	313 secs
Time to Patient	---	120 secs
Total 911 to Patient		605 secs

What To Watch

- Are "Injuries on Duty" increasing?
- Is attrition increasing?
- Is hiring/training keeping up with attrition?
- Are there changes in performance metrics over time? Rapid increases/decreases?
- Is data being gathered in a reliable fashion?
- Can key times be changed after the fact or improperly reported?
- How often units are moved out of an area to cover another area/city.

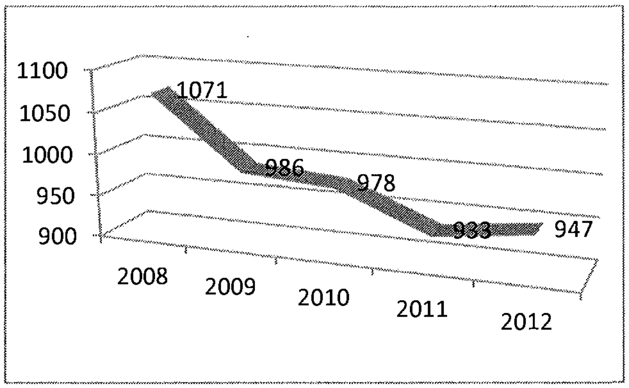
Key Questions

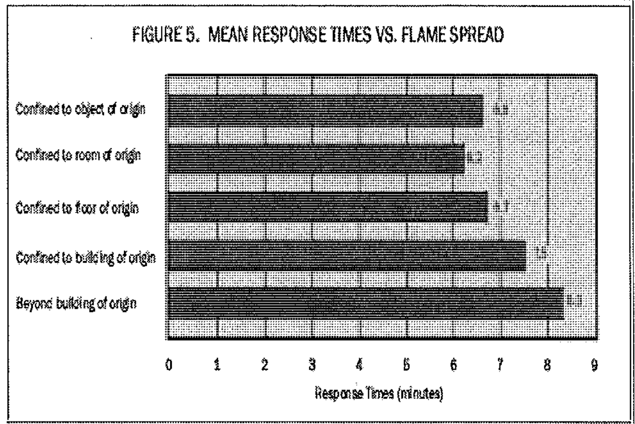
- What are the performance metrics for my area?
- How does the LAFD rely on redundancy?
- How many times have companies from outside my area had to respond into my area?
- How many times have units from my area had to respond outside my area?
- How many dispatchers are there at any given time? On Duty? In the building on stand-by?
- Do we have sufficient forces to handle a major disaster?

Key Call Types	LAFD Staffing	
EMS: Alpha, Bravo, Charlie, Delta, Echo with Alpha the least severe **Fire**: Structure, Rubbish, Brush **Others**: Auto and HazMat	Firefighters (Sworn) 3459 Admin/Non-Sworn 296 Per Shift 940	**LAFD receives 3000 calls per day which result in 1300 incidents.** 80% are EMS and 20% Fire. Fires require far more man-hours per incident. Time assigned to EMS and Fire are about equal.

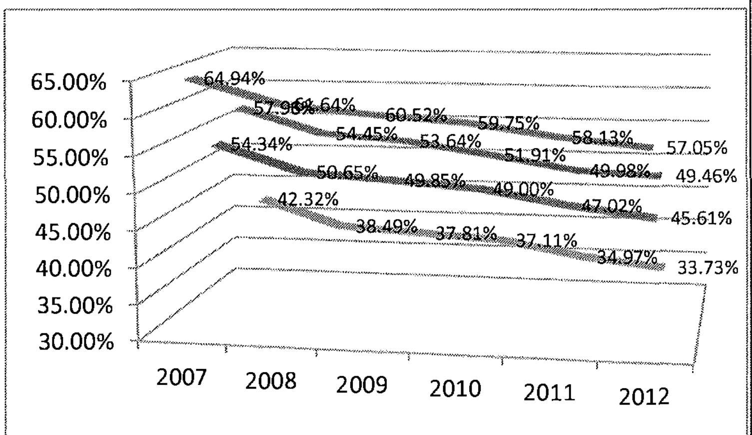
How Does Budget Impact Response Time?

Firefighters Per Shift



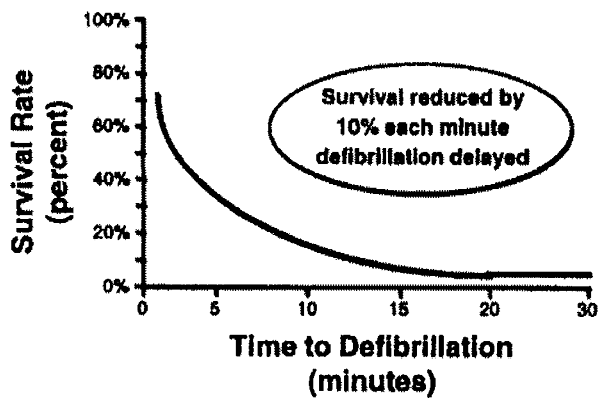


"5-Minute Response Times"



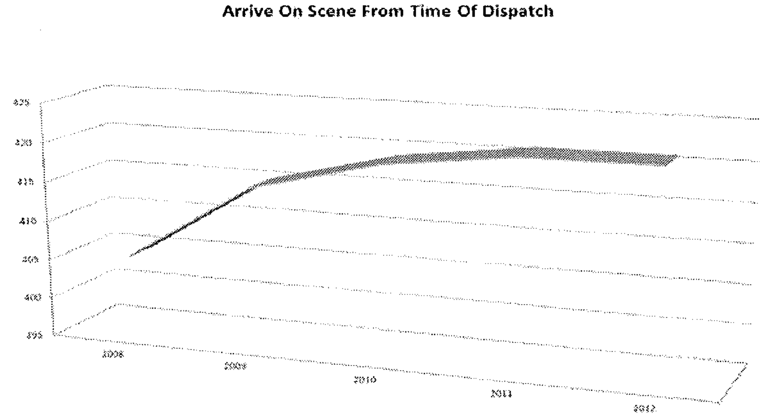
The "5-minute" clock ends when the "On Scene" button is pressed. Firefighters press that button between 10 and 60 seconds before they actually arrive. This chart shows response times no early press, 10, 30, and 60 second early presses.
Actual response% is between 33.7% and 49.46%.

How Important Is Response Time To Survival?



http://www.ncbi.nlm.nih.gov/pubmed/8323592

Arrive On Scene From Time Of Dispatch



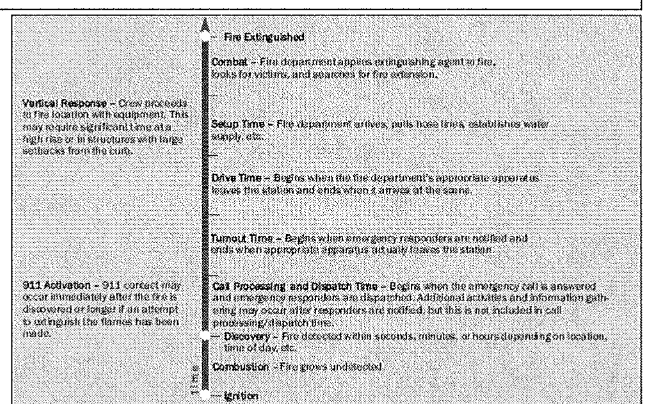


FIGURE 1. COMPONENTS OF TOTAL RESPONSE TIME

Exhibit 3

From: Laura Lake <laura.lake@gmail.com>
Sent: Tuesday, October 18, 2016 12:16 PM
To: Beverly Grossman Palmer
Subject: Fwd: Re: Thank you for yesterday's meeting

---------- Forwarded message ----------
From: **Laura Lake** <laura.lake@gmail.com>
Date: Thu, Sep 8, 2016 at 11:27 PM
Subject: Fwd: Re: Thank you for yesterday's meeting
To: Beverly Palmer <bpalmer@strumwooch.com>

Fyi

---------- Forwarded message ----------
From: "Edmond Yew" <edmond.yew@lacity.org>
Date: Sep 8, 2016 5:29 PM
Subject: Re: Thank you for yesterday's meeting
To: "Laura Lake" <laura.lake@gmail.com>
Cc: "James O'Sullivan" <jamesos@aol.com>, "Thein Crocker" <thein.crocker@lacity.org>

Laura,

See my comments in red. We mainly discussed about the Vacation process in the meeting.

Edmond

Hi Edmond,

Thank you so much for meeting with me and Jim O'Sullivan to discuss the 8150 Sunset project. I took a few notes, but wanted to make sure I understood all of the points you made. So please feel free to correct anything that is not accurate.

On September 7, 2016, Edmond Yew met with Laura Lake and James O'Sullivan to discuss the closure/vacation of Crescent Heights and the use of city-owned 8118 Sunset Boulevard for the project (for the so-called intersection "improvement" and as a public plaza). Julia Duncan from CD 4 arranged the meeting and attended it.

Mr. Yew thought the meeting was about the LACMA expansion. He said his office was unfamiliar with the project, and had never reviewed the proposal to close the Crescent Heights turn lane to traffic or to use 8118 Sunset for street purposes and a public plaza. He was not aware of a B or R permit being substituted for a street vacation.

He also stated that the EIR needed to be recirculated to address the closure of the street, vacation, etc. and that the vacation would be made by the decision maker a condition of approval for the tract map. A CEQA document would be needed for the vacation process. It might not need to be an EIR just for the vacation.

Laura Lake explained that the EIR response stated that the street would be closed through a merger and re-subdivision under the Tract Map. But the property involved is not within the tract, so that is not an option. That merger would also have required findings from the City Engineer.

He explained that normally, closure elimination of a street right of way requires a street vacation or merger through a tract map. But no request had been submitted. Likewise, no B Permit or R Permit had been discussed as an alternative. And LADOT had never consulted the City Engineer regarding the intersection "improvement" to round-off the triangle for a new right-turn.

Mr. Yew explained that normally, his office would ask neighbors how they feel about the closure Vacation, and would make required findings regarding current and future use. No such review has been conducted, including safety findings. He agreed that for Vacation state law required the City Engineer to find that the street was not needed now or in the future. No such findings have been made.

He explained that when an application is received to close Vacation a street or alley, his department canvasses the neighbors to determine whether or not they favor the closure Vacation. No such canvass has been conducted.

Mr. Yew raised two new points upon looking at the intersection plan provided by the applicant:

1. Sale use of the triangle property owned by the city would require it being declared surplus, and an ordinance to permit use by the project, and that Fair Market Value would have to be determined; and

2. an ordinance would be required to permit DOT to alter the tip of the triangle to round out the corner because it involved changing the use of property to street use. An ordinance would be needed to turn City property into public right of way.

We asked for another meeting to be arranged by CD 4 and City Engineer, this time with DOT present to explain how they could close a city street without a vacation being requested.

On Thu, Sep 8, 2016 at 3:25 PM, Laura Lake <laura.lake@gmail.com> wrote:
Hi Edmond,

Thank you so much for meeting with me and Jim O'Sullivan to discuss the 8150 Sunset project. I took a few notes, but wanted to make sure I understood all of the points you made. So please feel free to correct anything that is not accurate.

On September 7, 2016, Edmond Yew met with Laura Lake and James O'Sullivan to discuss the closure/vacation of Crescent Heights and the use of city-owned 8118 Sunset Boulevard for the project (for the so-called intersection "improvement" and as a public plaza). Julia Duncan from CD 4 arranged the meeting and attended it.

Mr. Yew thought the meeting was about the LACMA expansion. He said his office was unfamiliar with the project, and had never reviewed the proposal to close the Crescent Heights turn lane to traffic or to use 8118 Sunset for street purposes and a public plaza. He was not aware of a B or R permit being substituted for a street vacation.

He also stated that the EIR needed to be recirculated to address the closure of the street, vacation, etc. and that the vacation would be a condition of approval for the tract map.

Laura Lake explained that the EIR response stated that the street would be closed through a merger and re-subdivision under the Tract Map. But the property involved is not within the tract, so that is not an option. That merger would also have required findings from the City Engineer.

He explained that normally, closure of a street requires a street vacation or merger through a tract map. But no request had been submitted. Likewise, no B Permit or R Permit had been discussed as an alternative. And LADOT had never consulted the City Engineer regarding the intersection "improvement" to round-off the triangle for a new right-turn.

Mr. Yew explained that normally, his office would ask neighbors how they feel about the closure, and would make required findings regarding current and future use. No such review has been conducted, including safety findings. He agreed that state law required the City Engineer to find that the street was not needed now or in the future. No such findings have been made.

He explained that when an application is received to close a street or alley, his department canvasses the neighbors to determine whether or not they favor the closure. No such canvass has been conducted.

Mr. Yew raised two new points upon looking at the intersection plan provided by the applicant:

1. use of the triangle property owned by the city would require it being declared surplus, and an ordinance to permit use by the project, and that Fair Market Value would have to be determined; and

2. an ordinance would be required to permit DOT to alter the tip of the triangle to round out the corner because it involved changing the use of property to street use.

We asked for another meeting to be arranged by CD 4 and City Engineer, this time with DOT present to explain how they could close a city street without a vacation being requested.

Laura Lake, Ph.D.
Cell 310-497-5550

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Edmond Yew, P.E.
Land Development and GIS Division | Division Manager
Bureau of Engineering | Department of Public Works
201 N. Figueroa Street, Rm 200
Los Angeles, CA 90012
O: (213) 202-3490 I F: (213) 202-3499

ENGINEERING

CITY OF LOS ANGELES

--

Laura Lake, Ph.D.
Cell 310-497-5550

Exhibit 4

IV. Environmental Impact Analysis

E. Geology and Soils

1. Introduction

This section of the Draft EIR analyzes the Project's potential impacts with regard to geology and soils. The analysis includes an evaluation of the potential geologic hazards associated with fault rupture, seismic ground shaking, ground failure (i.e., liquefaction), landslides, inundation, expansive soils, and sedimentation and erosion. The analysis is based on the *Geotechnical Engineering Investigation* prepared for the Project Site by Geotechnologies, Inc. (October 15, 2013), included as Appendix J of this Draft EIR.

2. Environmental Setting

a. Regulatory Framework

(1) State of California

(a) Alquist–Priolo Earthquake Fault Zoning Act

The Alquist–Priolo Earthquake Fault Zoning Act (Public Resources Code [PRC] Section 2621) was enacted by the State of California in 1972 to address the hazard of surface faulting to structures for human occupancy.[1] The Alquist–Priolo Earthquake Fault Zoning Act was enacted in response to the 1971 San Fernando Earthquake, which was associated with extensive surface fault ruptures that damaged homes, commercial buildings, and other structures. The primary purpose of the Alquist–Priolo Earthquake Fault Zoning Act is to prevent the construction of buildings intended for human occupancy on the surface traces of active faults. The Alquist–Priolo Earthquake Fault Zoning Act is also intended to provide the citizens with increased safety and to minimize the loss of life during and immediately following earthquakes by facilitating seismic retrofitting to strengthen buildings against ground shaking.

The Alquist–Priolo Earthquake Fault Zoning Act requires the State Geologist to establish regulatory zones, known as "Earthquake Fault Zones," around the surface traces

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[1] *The Act was originally entitled the Alquist–Priolo Geologic Hazards Zone Act.*

of active faults and to issue appropriate maps to assist cities and counties in planning, zoning, and building regulation functions. Maps are distributed to all affected cities and counties for the controlling of new or renewed construction and are required to sufficiently define potential surface rupture or fault creep. The State Geologist is charged with continually reviewing new geologic and seismic data, and revising existing zones and delineating additional earthquake fault zones when warranted by new information. Local agencies must enforce the Alquist–Priolo Earthquake Fault Zoning Act in the development permit process, where applicable, and may be more restrictive than State law requires. According to the Alquist–Priolo Earthquake Fault Zoning Act, before a project can be permitted, cities and counties shall require a geologic investigation, prepared by a licensed geologist, to demonstrate that buildings will not be constructed across active faults. If an active fault is found, a structure for human occupancy cannot be placed over the trace of the fault and must be set back. Although setback distances may vary, a minimum 50-foot setback is required. The Alquist–Priolo Earthquake Fault Zoning Act and its regulations are presented in California Department of Conservation, CGS, Special Publications Special Publication 42, *Fault-rupture Hazard Zones in California*.

(b) Seismic Safety Act

The California Seismic Safety Commission was established by the Seismic Safety Act in 1975 with the intent of providing oversight, review, and recommendations to the Governor and State Legislature regarding seismic issues. The commission's name was changed to Alfred E. Alquist Seismic Safety Commission in 2006. Since then, the Commission has adopted several documents based on recorded earthquakes, including:[2]

- Research and Implementation Plan for Earthquake Risk Reduction in California 1995 to 2000, report dated December 1994;
- Seismic Safety in California's Schools, "Findings and Recommendations on Seismic Safety Policies and Requirements for Public, Private, and Charter Schools," report dated December 2004;
- Findings and Recommendations on Hospital Seismic Safety, report dated November 2001; and
- Commercial Property Owner's Guide to Earthquakes Safety, report dated October 2006.

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2 *Alfred E. Alquist Seismic Safety Commission. Publications, www.seismic.ca.gov/pub.html, accessed October 25, 2012.*

(c) Seismic Hazards Mapping Act

In order to address the effects of strong ground shaking, liquefaction, landslides, and other ground failures due to seismic events, the State of California passed the Seismic Hazards Mapping Act of 1990 (PRC Section 2690-2699). Under the Seismic Hazards Mapping Act, the State Geologist is required to delineate "seismic hazard zones." Cities and counties must regulate certain development projects within these zones until the geologic and soil conditions of the project site are investigated and appropriate mitigation measures, if any, are incorporated into development plans. The State Mining and Geology Board provides additional regulations and policies to assist municipalities in preparing the Safety Element of their General Plan and encourage land use management policies and regulations to reduce and mitigate those hazards to protect public health and safety. Under PRC Section 2697, cities and counties shall require, prior to the approval of a project located in a seismic hazard zone, a geotechnical report defining and delineating any seismic hazard. Each city or county shall submit one copy of each geotechnical report, including mitigation measures, to the State Geologist within 30 days of its approval. Under PRC Section 2698, nothing is intended to prevent cities and counties from establishing policies and criteria which are stricter than those established by the Mining and Geology Board.

State publications supporting the requirements of the Seismic Hazards Mapping Act include the CGS Special Publication 117, *Guidelines for Evaluating and Mitigating Seismic Hazards in California* and CGS Special Publication 118, *Recommended Criteria for Delineating Seismic Hazard Zones in California*. The objectives of Special Publication 117 are to assist in the evaluation and mitigation of earthquake-related hazards for projects within designated zones of required investigations and to promote uniform and effective statewide implementation of the evaluation and mitigation elements of the Seismic Hazards Mapping Act. Special Publication 118 implements the requirements of the Seismic Hazards Mapping Act in the production of Probabilistic Seismic Hazard Maps for the State.

(d) California Building Code

The California Building Code (CBC) [California Code of Regulations (CCR), Title 24] is a compilation of building standards, including seismic safety standards for new buildings. CBC standards are based on building standards that have been adopted by state agencies without change from a national model code; building standards based on a national model code that have been changed to address particular California conditions; and building standards authorized by the California legislature but not covered by the national model code. Given the State's susceptibility to seismic events, the seismic standards within the CBC are among the strictest in the world. The CBC includes provisions for demolition and construction as well as regulations regarding building foundations and soil types. The CBC applies to all occupancies in California, except where stricter standards have been adopted by local agencies. The CBC is published on a triennial basis, and supplements and errata can be issued throughout the cycle. The operative edition of the California Building Code is currently the 2010 edition, which became effective on January 1, 2011. The 2013 edition of the California Building Code has been adopted and will become effective on January 1, 2014.[3] The California Building Code incorporates the latest seismic design standards for structural loads and materials as well as provisions from the National Earthquake Hazards Reduction Program to mitigate losses from an earthquake and provide for the latest in earthquake safety. Specific CBC building and seismic safety regulations have been incorporated by reference in the Los Angeles Municipal Code with local amendments. As such, the CBC forms the basis of the Los Angeles Building Code.

(2) City of Los Angeles

(a) Los Angeles General Plan Safety Element

The City's General Plan Safety Element, which was adopted in 1996, addresses public safety risks due to natural disasters including seismic events and geologic conditions, as well as sets forth guidance for emergency response during such disasters. The Safety Element also provides maps of designated areas within the City that are considered susceptible to earthquake-induced hazards such as fault rupture and liquefaction.

(b) Los Angeles Building Code

Earthwork activities, including grading, are governed by the Los Angeles Building Code, which is contained in Los Angeles Municipal Code (LAMC), Chapter IX, Article 1. Specifically, Section 91.7006.7 includes requirements regarding import and export of material; Section 91.7010 includes regulations pertaining to excavations; Section 91.7011 includes requirements for fill materials; Section 91.7013 includes regulations pertaining to erosion control and drainage devices; Section 91.7014 includes general construction requirements as well as requirements regarding flood and mudflow protection; and Section 91.7016 includes regulations for areas that are subject to slides and unstable soils. Additionally, the Los Angeles Building Code includes specific requirements addressing seismic design, grading, foundation design, geologic investigations and reports, soil and rock testing, and groundwater. The Los Angeles Building Code incorporates by reference the CBC, with City amendments for additional requirements. The City Department of Building and Safety is responsible for implementing the provisions of the Los Angeles Building Code.

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[3] *California Building Standards Commission. 2013 California Building Standards Code, www.bsc.ca.gov/, accessed September 12, 2013.*

b. Existing Conditions

(1) Regional Geology

The Project Site is located in the Transverse Ranges Geomorphic Province. The Transverse Ranges are characterized by roughly east-west trending mountains and the northern and southern boundaries are formed by reverse fault scarps. The convergent deformational features of the Transverse Ranges are a result of north-south shortening due to plate tectonics. This has resulted in local folding and uplift of the mountains along with the propagation of thrust faults (including blind thrusts). The intervening valleys have been filled with sediments derived from the bordering mountains.

(2) Faulting and Seismicity

CGS has defined a fault as a fracture or zone of fractures along which there has been displacement of the adjacent blocks relative to one another. The southern California region is crossed by numerous faults, and is underlain by several blind thrust faults. As such, the region is susceptible to strong seismic groundshaking.

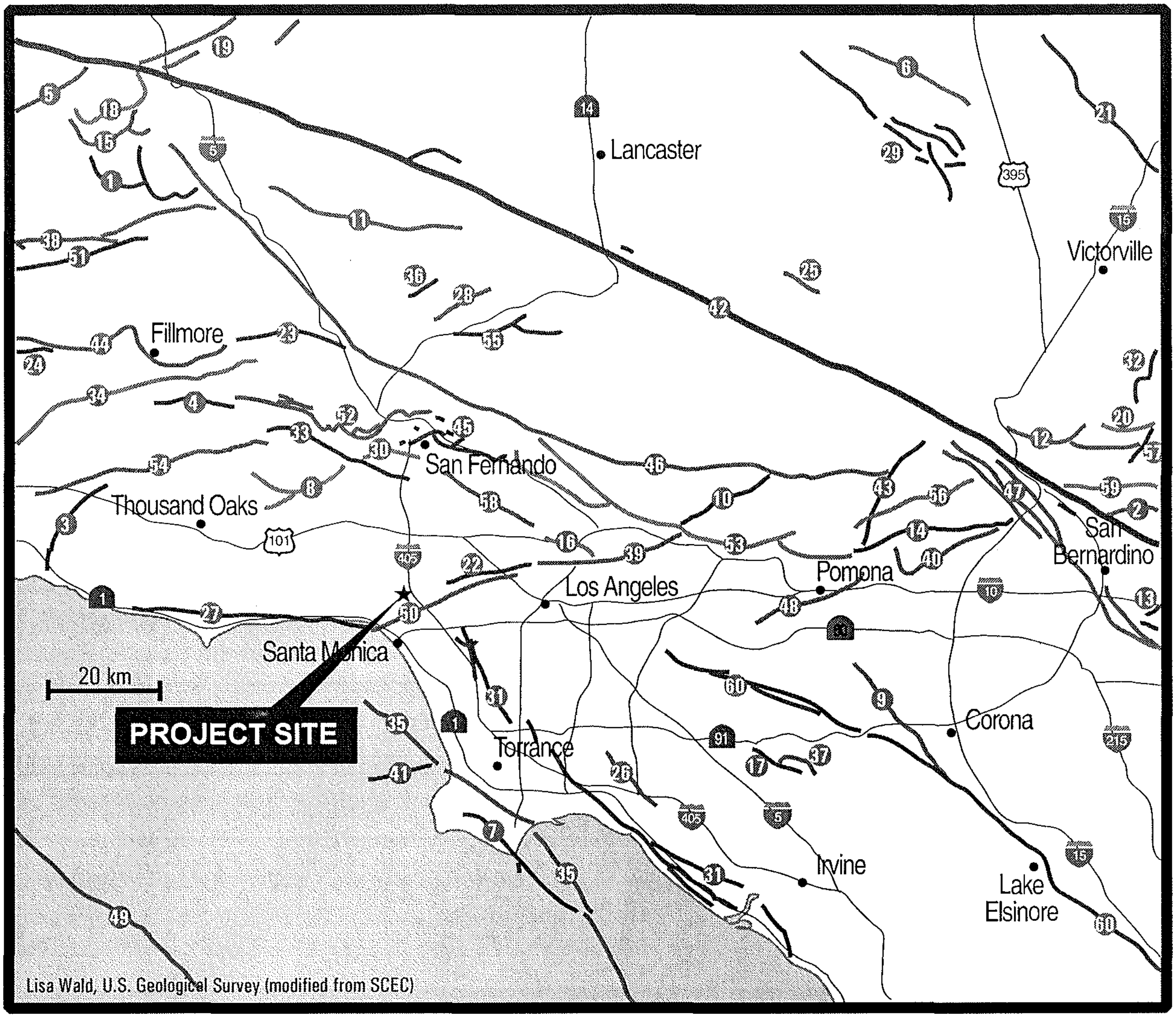
Based on criteria established by the CGS, faults may be categorized as active, potentially active, or inactive. Active faults are those that have shown evidence of surface displacement within the past 11,000 years (i.e., Holocene-age). Potentially active faults are those that have shown evidence of surface displacement within the last 1.6 million years (i.e., Quaternary-age). Inactive faults are those that have not shown evidence of surface displacement within the last 1.6 million years. Additionally, blind thrust faults, which are low angle reverse faults with no surface exposure, overlay areas of the region. While, the risk for surface rupture potential of blind thrusts faults is inferred to be low, blind thrust faults can be a significant source of seismic activity.

(a) Fault Locations

The locations of significant active and potentially active faults in the Southern California region are shown on the Southern California Fault Map illustrated in Figure IV.E-1 on page IV.E-6. In addition, Table IV.E-1 on page IV.E-7 lists the faults that are located within a 60-mile radius of the Project Site and indicates the significant active and potentially active faults in the vicinity of the Project Site.

(i) Active Faults

As discussed above, active faults are those which show evidence of surface displacement within the last 11,000 years (Holocene-age). A brief description of the major



1 Alamo thrust
2 Arrowhead fault
3 Bailey fault
4 Big Mountain fault
5 Big Pine fault
6 Blake Ranch fault
7 Cabrillo fault
8 Chatsworth fault
9 Chino fault
10 Clamshell-Sawpit fault
11 Clearwater fault
12 Cleghorn fault
13 Crafton Hills fault zone
14 Cucamonga fault zone
15 Dry Creek
16 Eagle Rock fault
17 El Modeno
18 Frazier Mountain thrust
19 Garlock fault zone
20 Grass Valley fault
21 Helendale fault
22 Hollywood fault
23 Holser fault
24 Lion Canyon fault
25 Llano fault
26 Los Alamitos fault
27 Malibu Coast fault
28 Mint Canyon fault
29 Mirage Valley fault zone
30 Mission Hills fault
31 Newport Inglewood fault zone
32 North Frontal fault zone
33 Northridge Hills fault
34 Oak Ridge fault
35 Palos Verdes fault zone
36 Pelona fault
37 Peralta Hills fault
38 Pine Mountain fault
39 Raymond fault
40 Red Hill (Etiwanda Ave) fault
41 Redondo Canyon fault
42 San Andreas Fault
43 San Antonio fault
44 San Cayetano fault
45 San Fernando fault zone
46 San Gabriel fault zone
47 San Jacinto fault
48 San Jose fault
49 Santa Cruz-Santa Catalina Ridge f.z.
50 Santa Monica fault
51 Santa Ynez fault
52 Santa Susana fault zone
53 Sierra Madre fault zone
54 Simi fault
55 Soledad Canyon fault
56 Stoddard Canyon fault
57 Tunnel Ridge fault
58 Verdugo fault
59 Waterman Canyon fault
60 Whittier fault

matrix environmental

Figure IV.E-1
Southern California Fault Map

Source: Lisa Wald, U.S. Geological Survey (modified from SCEC), 2012.

Table IV.E-1
Major Active and Potentially Active Faults in the Southern California Region

Abbreviated Fault Name	Approximate Distance from Project Site (miles)	Maximum Earthquake Magnitude[a] (M_w)
Active Faults		
Malibu Coast (EFZ)	4.00	7.0
Hollywood	4.00	6.7
Newport–Inglewood (EFZ)	6.20	7.5
Palos Verdes	8.16	7.7
Verdugo	12.46	6.9
Northridge	14.17	6.9
Raymond (EFZ)	15.00	6.8
Sierra Madre (San Fernando) (EFZ)	15.73	6.7
Sierra Madre	16.00	7.3
Santa Susana	16.00	6.9
Simi-Santa Rosa (EFZ)	20.87	6.9
Elsinore (EFZ)	24.74	7.8
San Cayetano (EFZ)	30.50	7.2
San Andreas (EFZ)	39.02	8.2
Santa Ynez (East)	41.43	7.2
Cucamonga (EFZ)	41.78	6.7
Ventura-Pitas Point (EFZ)	42.78	7.0
Santa Cruz Island	45.46	7.2
Newport–Inglewood (Offshore)	45.77	7.0
Red Mountain (EFZ)	51.13	7.4
San Jacinto (EFZ)	54.16	7.9
North Channel (EFZ)	57.19	6.8
Garlock (EFZ)	57.40	7.7
Pleito (EFZ)	58.07	7.1
Potentially Active Faults		
Santa Monica, alt 1	1.26	6.8
Santa Monica, Connected alt 1	1.42	7.3
Anacapa–Dume	5.56	7.2
San Gabriel (EFZ)	20.60	7.3
Clamshell–Sawpit	27.53	6.7
Chino	37.95	6.7
Oak Ridge (Offshore)	44.07	7.0

EFZ = Earthquake Fault Zone

[a] *Moment magnitude scale (denoted as M_w) is a logarithmic scale of 1 to 10 that enables seismologists to compare the energy released by different earthquakes on the basis of the area of the geological fault that ruptured in the quake. Developed after the commonly known Richter scale, the moment magnitude scale retains the familiar continuum of magnitude values defined by the Richter scale, and is the scale used to estimate magnitudes for all modern large earthquakes by the United States Geological Survey.*

Source: Geotechnologies, Inc., May 2012.

active fault systems in the Project Site vicinity is provided below. No known active fault crosses the Project Site.

Malibu Coast Earthquake Fault Zone

The Malibu Coast fault zone is part of the Transverse Ranges Southern Boundary fault system, a west-trending system of reverse, oblique-slip, and strike-slip faults that extends for more than approximately 124 miles along the southern edge of the Transverse Ranges and includes the Hollywood, Raymond, Anacapa–Dume, Malibu Coast, Santa Cruz Island, and Santa Rosa Island faults. The Malibu Coast fault zone runs in an east-west orientation onshore subparallel to and along the shoreline for a linear distance of about 17 miles through the Malibu City limits, but also extends offshore to the east and west for a total length of approximately 37.5 miles. The onshore Malibu Coast fault zone involves a broad, wide zone of faulting and shearing as much as 1 mile in width. While the Malibu Coast Fault Zone has not been officially designated as an active fault zone by the State of California and no Special Studies Zones have been delineated along any part of the fault zone under the Alquist–Priolo Act of 1972, evidence for Holocene activity (movement in the last 11,000 years) has been established in several locations along individual fault splays within the fault zone. Due to such evidence, several fault splays within the onshore portion of the fault zone are identified as active.[4] Large historic earthquakes along the Malibu Coast fault include the 1979, 5.2 magnitude earthquake and the 1989, 5.0 magnitude earthquake.[5] The Malibu Coast fault zone is approximately 4 miles southwest of the Project Site and is believed to be capable of producing a maximum 7.0 magnitude earthquake.

Hollywood Fault

The Hollywood fault zone is part of the Transverse Ranges Southern Boundary fault system. The Hollywood fault is located approximately 4 miles southeast of the Project Site. This fault trends east-west along the base of the Santa Monica Mountains from the West Beverly Hills Lineament in the West Hollywood–Beverly Hills area to the Los Feliz area of Los Angeles. The Hollywood fault is the eastern segment of the reverse oblique Santa Monica–Hollywood fault. Based on geomorphic evidence, stratigraphic correlation between exploratory borings, and fault trenching studies, this fault is classified as active.

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4 *City of Malibu Planning Department. Malibu General Plan, Chapter 5.0, Safety and Health Element, http://qcode.us/codes/malibu-general-plan/; accessed October 25, 2012.*

5 *California Institute of Technology, Southern California Data Center. Chronological Earthquake Index, www.data.scec.org/significant/malibu1979.html; accessed October 25, 2012.*

Until recently, the approximately 9.3-mile long Hollywood fault was considered to be expressed as a series of linear ground-surface geomorphic expressions and south-facing ridges along the south margin of the eastern Santa Monica Mountains and the Hollywood Hills. Multiple recent fault rupture hazard investigations have shown that the Hollywood fault is located south of the ridges and bedrock outcroppings along Sunset Boulevard. The Hollywood fault has not produced any damaging earthquakes during the historical period and has had relatively minor micro-seismic activity. It is estimated that the Hollywood fault is capable of producing a maximum 6.7 magnitude earthquake. An Alquist–Priolo Earthquake Fault Zone has not been established for the Hollywood fault. However, the Hollywood fault is considered active by the State and the City of Los Angeles.

Newport–Inglewood Earthquake Fault Zone

The Newport–Inglewood fault system is located approximately 6.2 miles east of the Project Site. The Newport–Inglewood fault zone is a broad zone of discontinuous north to northwest en echelon faults and northwest to west trending folds. The fault zone extends southeastward from West Los Angeles, across the Los Angeles Basin, to Newport Beach and possibly offshore beyond San Diego. The onshore segment of the Newport–Inglewood fault zone extends for about 37 miles from the Santa Ana River to the Santa Monica Mountains. Here it is overridden by, or merges with, the east-west trending Santa Monica zone of reverse faults.

The surface expression of the Newport–Inglewood fault zone is made up of a strikingly linear alignment of domal hills and mesas that rise as much as 400 feet above the surrounding plains. From the northern end to its southernmost onshore expression, the Newport–Inglewood fault zone is made up of: Cheviot Hills, Baldwin Hills, Rosecrans Hills, Dominguez Hills, Signal Hill Reservoir Hill, Alamitos Heights, Landing Hill, Bolsa Chica Mesa, Huntington Beach Mesa, and Newport Mesa. Several single and multiple fault strands, arranged in a roughly left stepping en echelon arrangement, make up the fault zone and account for the uplifted mesas.

The most significant earthquake associated with the Newport–Inglewood fault system was the Long Beach earthquake of 1933 with a magnitude of 6.3 on the Richter scale. It is believed that the Newport–Inglewood fault zone is capable of producing a maximum 7.5 magnitude earthquake.

Palos Verdes Fault

Studies indicate that there are several active on-shore extensions of the strike-slip Palos Verdes fault, which is located approximately 8.16 miles south-southeast of the Project Site. Geophysical data also indicate the off-shore extensions of the fault are active, offsetting Holocene age deposits. No historic large magnitude earthquakes are associated with this fault. However, the fault is considered active by the CGS. It is estimated that the Palos Verdes fault is capable of producing a maximum 7.7 magnitude earthquake. An Alquist–Priolo Earthquake Fault Zone has not been established for this fault.

Raymond Earthquake Fault Zone

The Raymond fault is part of the Transverse Ranges Southern Boundary fault system and lies approximately 15 miles east of the Project Site. The Raymond fault extends approximately 15 miles from the Los Angeles River east of Griffith Park east to east-northeast across the San Gabriel Valley through South Pasadena, Pasadena, San Marino, Arcadia, and Monrovia to a junction with the Sierra Madre fault at the foot of the San Gabriel Mountains. The fault is convex southward, consisting of a western section that strikes east-west and an eastern section that strikes east-northeast. The Raymond fault joins the Sierra Madre fault south of Santa Anita Wash and south of the Clamshell–Sawpit fault in the foothills of the San Gabriel Mountains on which the 1991 Sierra Madre earthquake of magnitude 5.8 occurred. The 1988 Pasadena earthquake of magnitude 5.0 is also believed to have occurred on the Raymond fault.[6] It is believed that the Raymond fault may produce a maximum 6.8 magnitude earthquake.

Sierra Madre Fault Zone

The Sierra Madre fault alone forms the southern tectonic boundary of the San Gabriel Mountains in the northern San Fernando Valley. It consists of a system of faults approximately 75 miles in length. The individual segments of the Sierra Madre fault system range up to 16 miles in length and display a reverse sense of displacement and dip to the north. The most recently actively portions of the zone include the Mission Hills, Sylmar, and Lakeview segments, which produced an earthquake in 1971 of magnitude 6.4. Tectonic rupture along the Lakeview Segment during the San Fernando Earthquake of 1971 produced displacements of approximately 2.5 to 4 feet upward and southwestward.

It is believed that the Sierra Madre fault zone is capable of producing an earthquake of magnitude 7.3 with a recurrence interval of 200 years. The closest trace of the fault is approximately 16 miles northeast of the Project Site.

[6] *Southern California Earthquake Center, a National Science Foundation and U.S. Geological Survey Center. Active Faults in the Los Angeles Metropolitan Region, www.scec.org/research/special/SCEC001 activefaultsLA.pdf; accessed May 24, 2012.*

Santa Susana Fault

The western Transverse Ranges are crossed obliquely by a set of north-dipping reverse faults extending from the Santa Barbara Channel east to an intersection with the San Jacinto fault near Cajon Pass. These faults include, from west to east, the Red Mountain, San Cayetano, Santa Susana, Sierra Madre, and Cucamonga faults. These faults are located approximately 51, 30, 16, 15, and 41 miles, respectively, from the Project Site.

The Santa Susana fault extends approximately 17 miles west-northwest from the northwest edge of the San Fernando Valley into Ventura County and is at the surface high on the south flank of the Santa Susana Mountains. The fault ends near the point where it overrides the south-side-up South strand of the Oak Ridge fault. The Santa Susana fault strikes northeast at the Fernando lateral ramp and turns east at the northern margin of the Sylmar Basin to become the Sierra Madre fault. This fault is exposed near the base of the San Gabriel Mountains for approximately 46 miles from the San Fernando Pass at the Fernando lateral ramp east to its intersection with the San Antonio Canyon fault in the eastern San Gabriel Mountains, east of which the range front is formed by the Cucamonga fault. The Santa Susana fault has not experienced any recent major ruptures except for a slight rupture during the 6.5 magnitude 1971 Sylmar earthquake.[7] It is believed that the Santa Susana fault has the potential to produce a 6.9 magnitude earthquake.

San Andreas Fault System

The San Andreas fault system forms a major plate tectonic boundary along the western portion of North America. The system is predominantly a series of northwest trending faults characterized by a predominant right lateral sense of movement. The fault system is located approximately 39 miles to the northeast of the Project Site.

The San Andreas and associated faults have a long history of inferred and historic earthquakes. Cumulative displacement along the system exceeds 150 miles in the past 25 million years. Large historic earthquakes have occurred at Fort Tejon in 1857, at Point Reyes in 1906, and at Loma Prieta in 1989. Based on single-event rupture length, the maximum Richter magnitude earthquake is expected to be approximately 8.25.[8] The

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[7] *California Institute of Technology, Southern California Data Center. Chronological Earthquake Index, www.data.scec.org/significant/santasusana.html; accessed May 24, 2012.*

[8] *The Richter scale is an open-ended logarithmic scale for expressing the magnitude of a seismic disturbance in terms of the energy dissipated in it, with 1.5 indicating the smallest earthquake that can be felt, 4.5 indicating an earthquake causing slight damage, and 8.5 indicating a very devastating earthquake.*

recurrence interval for large earthquakes on the southern portion of the fault system is on the order of 100 to 200 years. It is believed that the San Andreas fault is capable of producing a 8.2 magnitude earthquake.

(ii) Potentially Active Faults

As discussed above, potentially active faults are those that show evidence of most recent surface displacement within the last 1.6 million years (Quaternary-age). The potentially active faults in the Project vicinity are discussed below.

Santa Monica

The Santa Monica fault located approximately 1.26 to 1.42 miles to the south of the Project Site is also part of the Transverse Ranges Southern Boundary fault system. The Santa Monica fault extends east from the coastline in Pacific Palisades through Santa Monica and West Los Angeles and merges with the Hollywood fault at the West Beverly Hills Lineament in Beverly Hills where its strike is northeast. It is believed that at least six surface ruptures have occurred in the past 50 thousand years. In addition, a well-documented surface rupture occurred between 10 and 17 thousand years ago, although a more recent earthquake probably occurred 1 to 3 thousand years ago. This leads to an average earthquake recurrence interval of 7 to 8 thousand years.[9] The Santa Monica fault system may produce earthquakes with a maximum magnitude of 6.8 to 7.3.

Anacapa–Dume Fault

The Anacapa–Dume fault located approximately 5.56 miles to the southwest of the Project Site is a near-vertical offshore escarpment exceeding 600 meters locally, with a total length exceeding 62 miles. This fault is also part of the Transverse Ranges Southern Boundary fault system. It occurs as close as 3.6 miles offshore south of Malibu at its western end, but trends northeast where it merges with the offshore segment(s) of the Santa Monica Fault Zone. It is believed that the Anacapa–Dume fault is responsible for generating the historic 1930 magnitude 5.2 Santa Monica earthquake, the 1973 magnitude 5.3 Point Mugu earthquake, and the 1979 and 1989 Malibu earthquakes, each of which possessed a magnitude of 5.0.[10] The Anacapa–Dume fault may be capable of producing a maximum magnitude 7.2 earthquake.

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[9] *Southern California Earthquake Center, a National Science Foundation and U.S. Geological Survey Center. Active Faults in the Los Angeles Metropolitan Region, www.scec.org/research/special/SCEC001 activefaultsLA.pdf; accessed May 24, 2012.*

[10] *City of Malibu Planning Department. Malibu General Plan, Chapter 5.0, Safety and Health Element, http://qcode.us/codes/malibu-general-plan/; accessed May 24, 2012.*

San Gabriel Fault System

The San Gabriel fault system is located approximately 20.6 miles northeast of the Project Site. The San Gabriel fault system comprises a series of sub-parallel, steeply north-dipping faults trending approximately north 40 degrees west with a right-lateral sense of displacement. There is also a small component of vertical dip-slip separation. The fault system exhibits a strong topographic expression and extends approximately 90 miles from San Antonio Canyon on the southeast to Frazier Mountain on the northwest. The estimated right lateral displacement on the fault varies from 34 miles to 40 miles to 10 miles. The San Gabriel fault system is considered potentially active by the CGS with a potential to produce a 7.3 magnitude earthquake. However, recent seismic exploration in the Valencia area has indicated that faulting in the Valencia area occurred between 3,500 and 1,500 years ago. In addition, seismic evidence indicates that the San Gabriel fault system is truncated at depth by the younger, north-dipping Santa Susana–Sierra Madre faults. Therefore, it is generally accepted that the San Gabriel fault system is not capable of producing large earthquakes. However, ground rupture may be produced in response to passive movement.

(iii) Blind Thrusts Faults

Blind or buried thrust faults are faults without a surface expression but are a significant source of seismic activity. They are typically broadly defined based on the analysis of seismic wave recordings of hundreds of small and large earthquakes in the southern California area. Due to the buried nature of these thrust faults, their existence is sometimes not known until they produce an earthquake. Two blind thrust faults in the Los Angeles metropolitan area are the Puente Hills blind thrust located just east of Downtown Los Angeles and the Elysian Park blind thrust just north of Downtown Los Angeles. Another blind thrust fault of note is the Northridge fault located in the northwestern portion of the San Fernando Valley. These blind thrust faults are described below.

Puente Hills Blind Thrust

The Puente Hills blind thrust fault extends eastward from Downtown Los Angeles to the City of Brea in northern Orange County. The Puente Hills blind thrust fault includes three north-dipping segments, named from east to west as the Coyote Hills segment, the Santa Fe Springs segment, and the Los Angeles segment. These segments are overlain by folds expressed at the surface as the Coyote Hills, Santa Fe Springs Anticline, and the Montebello Hills. The Puente Hills blind thrust fault lies directly beneath downtown Los Angeles.

The Santa Fe Springs segment of the Puente Hills blind thrust fault is believed to be the cause of the October 1, 1987, Whittier Narrows Earthquake. Earthquake scenarios for the Puente Hills blind thrust fault include single-segment fault ruptures capable of producing an earthquake of magnitude 6.5 to 6.6 moment magnitude and a multiple-segment fault rupture capable of producing an earthquake of magnitude 7.1. Based on deformation of late Quaternary age sediments above this fault system and the occurrence of the Whittier Narrows earthquake, the Puente Hills blind thrust fault is considered an active fault capable of generating future earthquakes beneath the Los Angeles Basin. An average slip rate of 0.7 millimeter per year and a maximum moment magnitude of 7.1 are estimated by the CGS for the Puente Hills blind thrust fault.

Elysian Park Blind Thrust

The Elysian Park anticline is thought to overlie the Elysian Park blind thrust. This fault has been estimated to cause an earthquake every 500 to 1,300 years in the magnitude range of 6.2 to 6.7. The Elysian Park anticline is located approximately 10 miles east of the Project Site.

Northridge (Blind) Thrust

The January 17, 1994, 6.7 moment magnitude Northridge earthquake was caused by the sudden rupture of a previously unknown blind thrust fault. This fault has since been named the Northridge Thrust. The Northridge Thrust is an active feature that can generate future earthquakes. The Northridge Thrust is located approximately 14 miles north of the Project Site. The CGS estimates an average slip rate of 1.5 millimeters per year and 7.0 maximum moment magnitude for the Northridge Thrust.

(b) Surface Ground Rupture

Ground rupture is the visible breaking and displacement of the earth's surface along the trace of a fault during an earthquake. The Alquist–Priolo Earthquake Fault Zoning Act, described further above, requires the State Geologist to establish and map fault rupture zones (called earthquake fault zones). These zones, which generally extend from 200 to 500 feet on each side of a known active fault, identify areas where potential fault rupture along an active fault could prove hazardous and identify where special studies are required to characterize hazards to habitable structures. In addition, the City of Los Angeles General Plan Safety Element designates fault rupture study areas extending along each side of active and potentially active faults to establish areas of hazard potential due to fault rupture.

As indicated in the Geotechnical Engineering Investigation for the Project Site, no known active or potentially active faults underlie the Project Site. In addition, as shown in Figure IV.E-2 on page IV.E-15, the Project Site is not located within a State-designated Alquist–Priolo Earthquake Fault Zone or within a City-designated fault rupture study area.

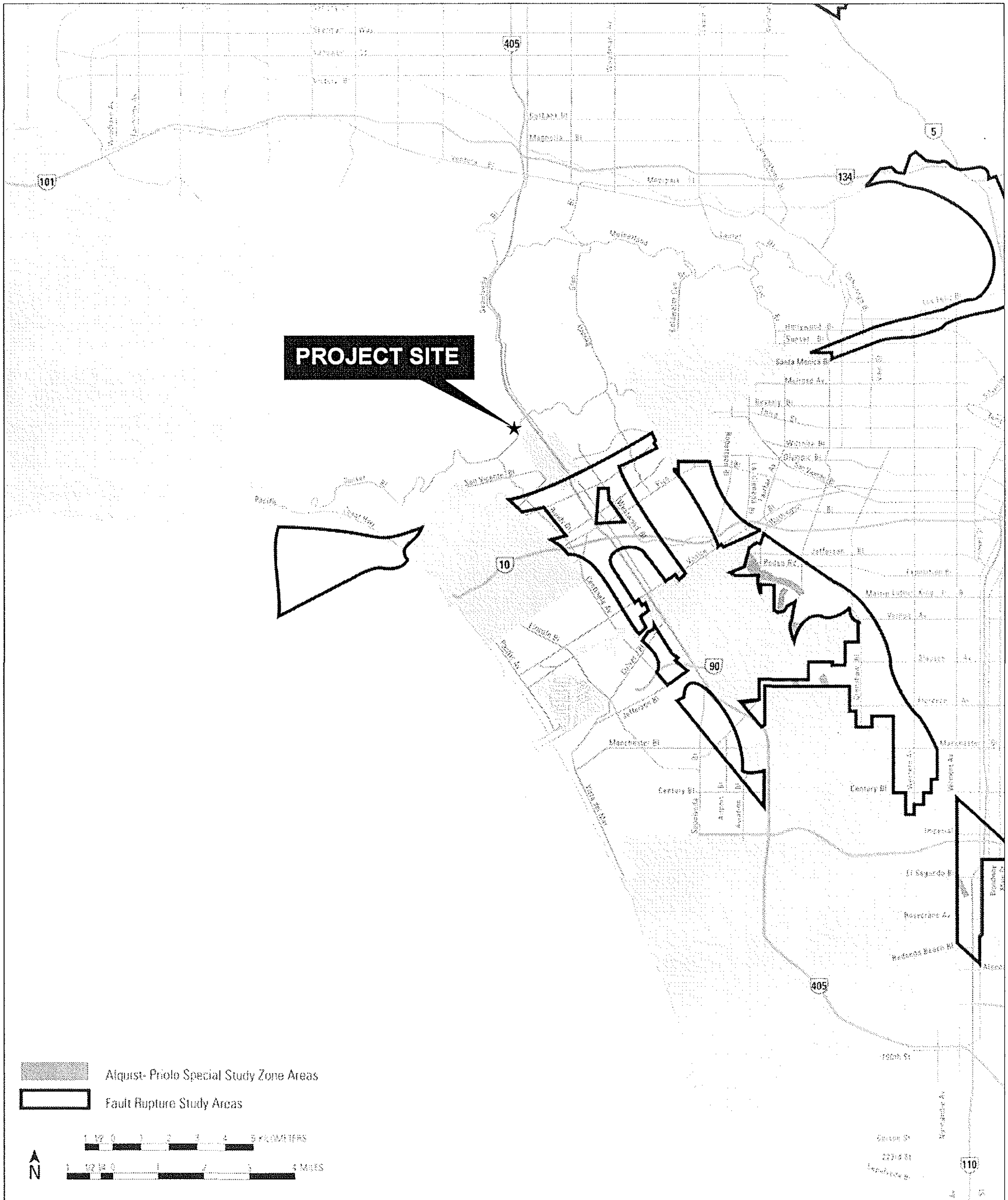

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Figure IV.E-2
Alquist-Priolo Special Study Zones
and Fault Rupture Study Areas
in the City of Los Angeles

Source: City of Los Angeles General Plan Safety Element, Exhibit A, 2008.

As shown in Table IV.E-1 on page IV.E-7, the nearest active fault with surface displacement is the Malibu Coast fault, located approximately 4 miles southwest of the Project Site. However, only a small segment of this fault, located approximately 16 miles away from the Project Site, has been given an Earthquake Fault Zone designation. Thus, the nearest Earthquake Fault Zone designation to the Project Site is associated with the Newport-Inglewood fault, which is located approximately 6 miles to the east of the Project Site. Based on the distance of the nearest Earthquake Fault Zone to the Project Site, the potential for surface ground rupture within the Project Site is low.

(3) Local Geology

(a) Soil Conditions

Based on on-site investigations conducted as part of the Geotechnical Engineering Investigation for the Project Site, encountered fill materials varied between 1 and 5 feet in depth. Fill materials consisted of mixtures of sand, silt, and clay, which ranged from light brown to orange brown to dark brown in color, slightly moist to moist, loose to medium dense or medium firm to stiff, and fine grained with occasional gravel, slate fragments, and concrete fragments. The fill was found to be underlain by older alluvial soils consisting of interlayered mixtures of sand, silt, and clay. The older alluvium ranged in color from brown to reddish brown to dark brown, and was slightly moist to moist, dense to very dense, stiff to very stiff, and fine to coarse grained with occasional gravel. Slate fragments were also found, varying from occasional to abundant.

Expansive soils are soils that swell when subjected to moisture and shrink when dried. Depending on the soil characteristics and design of building construction, expansive soils can cause extensive damage to building foundations. Expansive soils are typically associated with clayey soils. The soils underlying the Project Site consist of interlayered mixtures of sand, silt, and clay. Based on the Geotechnical Engineering Investigation for the Project Site, the soils beneath the Project Site are in the low to high expansion range.

(b) Liquefaction

Liquefaction is a phenomenon in which saturated silty to cohesionless soils below the groundwater table are subject to a temporary loss of strength due to the buildup of excess pore pressure during cyclic loading conditions such as those induced by an earthquake. Liquefaction-related effects include loss of bearing strength, amplified ground oscillations, lateral spreading, and flow failures.

The Seismic Hazards Mapping Act requires the State Geologist to delineate seismic hazard zones in areas where the potential for strong ground shaking, liquefaction, landslides, and other ground failures due to seismic events are likely to occur. Cities and counties must regulate certain development projects within these zones until the geologic and soil conditions of a project site are investigated and appropriate mitigation measures, if any, are incorporated into development plans. In accordance with the Seismic Hazards Mapping Act, the California Geologic Survey has produced Seismic Hazards Zone Maps. As shown in Figure IV.E-3 on page IV.E-18, based on the Seismic Hazard Zone Map for the Beverly Hills Quadrangle, the Project Site is not located within a State-designated seismic hazard zone for liquefaction potential.[11] This determination is based on groundwater depth records, soil type, and distance to a fault capable of producing a substantial earthquake. In addition, based on the City of Los Angeles General Plan Safety Element, the Project Site is not located within a City-designated liquefiable area or potentially liquefiable area.[12] Furthermore, based on a liquefaction potential evaluation performed as part of the Geotechnical Engineering Investigation, the soils underlying the Project Site would not be capable of liquefaction during the design earthquake.

(c) Landslides

As shown in Figure IV.E-3, based on the Seismic Hazard Zone Map for the Beverly Hills Quadrangle, the Project Site is not located within a State-designated seismic hazard zone for landslide potential.[13] As shown in Figure IV.E-4 on page IV.E-19, per the City of Los Angeles General Plan Safety Element, the Project Site is located within an area designated as "cluster of small shallow surfacal landslides."[14]

(d) Groundwater

As indicated in the Geotechnical Engineering Investigation prepared for the Project Site, groundwater was not encountered during exploration conducted to a maximum depth of 60 feet below the existing grade. In addition, California Geologic Survey data indicates the historically highest groundwater level within the Project Site is 40 feet below grade.

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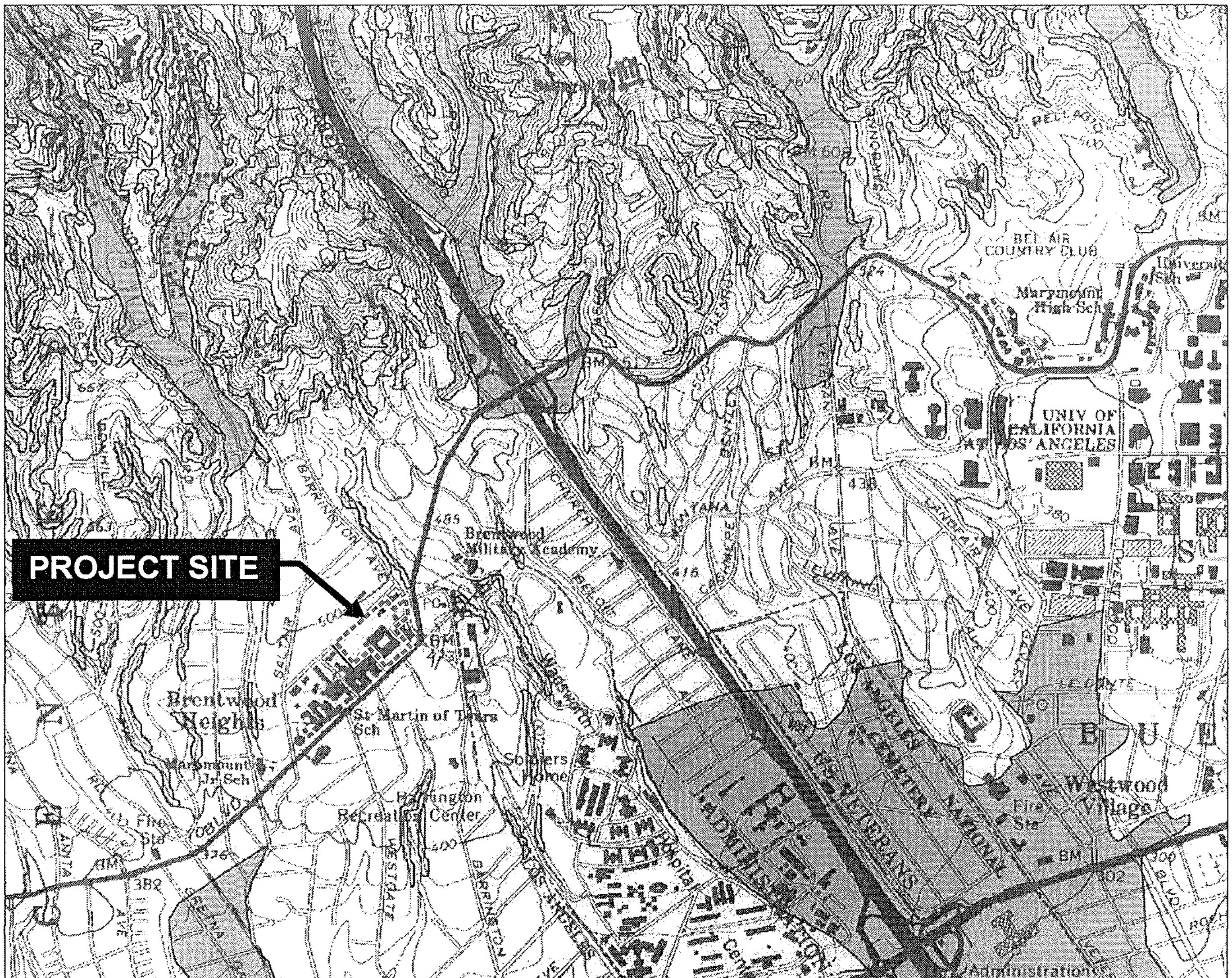
[11] *California Department of Conservation, Division of Mines and Geology. State of California Seismic Hazard Zones Beverly Hills Quadrangle, March 25, 1999, http://gmw.consrv.ca.gov/shmp/download/pdf/ozn_bevh.pdf, accessed December 22, 2011.*

[12] *City of Los Angeles. General Plan Safety Element, Exhibit B, adopted by the City Council, November 26, 1996.*

[13] *California Department of Conservation, Division of Mines and Geology. State of California Seismic Hazard Zones Beverly Hills Quadrangle, March 25, 1999, http://gmw.consrv.ca.gov/shmp/download/pdf/ozn_bevh.pdf, October 25, 2012.*

[14] *City of Los Angeles. General Plan Safety Element, Exhibit C, adopted by the City Council, November 26, 1996.*



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MAP EXPLANATION

Zones of Required Investigation:

Liquefaction
Areas where historic occurrence of liquefaction, or local geological, geotechnical and groundwater conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693© would be required.

Earthquake-Induced Landslides
Areas where previous occurrence of landslide movement, or local topographic, geological and subsurface water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693© would be required.

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Figure IV.E-3
Seismic Hazard Zone Map

Source: California Department of Conservation, Division of Mines and Geology, 2012.

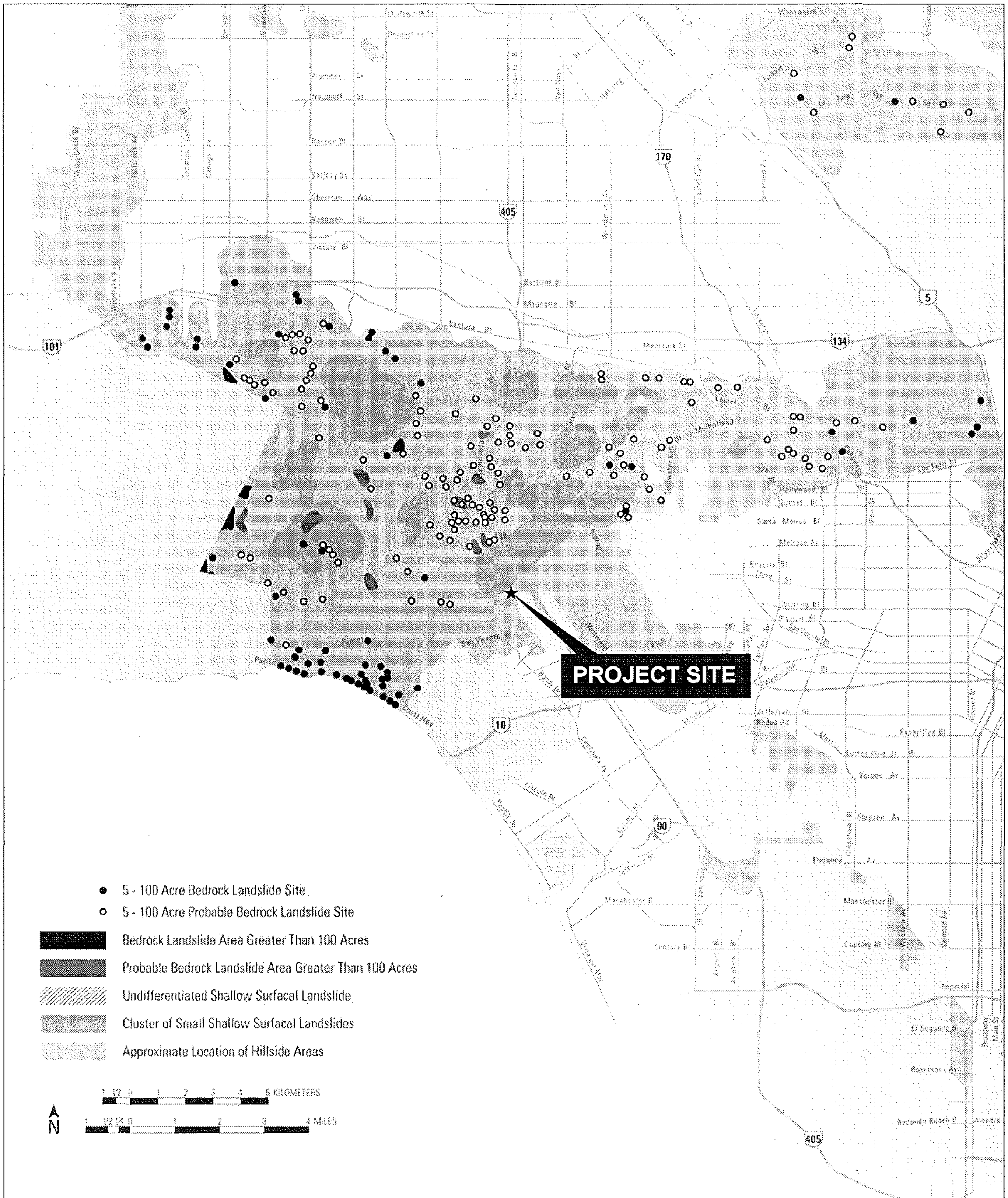

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Figure IV.E-4
Landslide Inventory and Hillside Areas

Source: City of Los Angeles General Plan Safety Element, Exhibit C, 2008.

(e) Other Geologic Conditions

The Project Site ranges in elevation from 495 feet on the northern boundary adjacent to Chaparal Street, to 465 feet on the southern boundary adjacent to Sunset Boulevard. The steepest slope gradient found in the site is approximately 5:1 horizontal to vertical. No major water-retaining structures are located immediately up gradient from the Project Site. In addition, review of the County of Los Angeles Flood and Inundation Hazards Map indicates the Project Site does not lie within mapped inundation boundaries due to a breached upgradient reservoir. The Project Site is also not located within a City of Los Angeles Methane Zone or Methane Buffer Zone. Additionally, according to the Division of Oil, Gas, and Geothermal Resources Regional Wildcat Map, the Project Site is not located within the limits of an oil field, and no oil wells have been drilled on the Project Site. Lastly, no distinct or prominent geologic or topographic features such as hilltops, ridges, hillslopes, canyons, ravines, rock outcrops, water bodies, streambeds, or wetlands are located at the Project Site.

3. Environmental Impacts

a. Methodology

To evaluate potential impacts relative to geology and soils, the Geotechnical Engineering Investigation was prepared for the Project Site. The Geotechnical Engineering Investigation included field exploration (i.e., exploratory soil borings) and laboratory testing to determine the characteristics of the subsurface conditions at the Project Site. In addition, relevant literature (CGS' Seismic Hazard Zone Maps, previous geotechnical studies, etc.) and materials were reviewed. Recommendations regarding the design and construction of the Project are based on these results. The Geotechnical Engineering Investigation is provided in Appendix J of this Draft EIR.

b. Thresholds of Significance

Appendix G of the CEQA Guidelines provides a set of sample questions that address impacts with regard to geology and soils. These questions are as follows:

Would the project:

- Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:
  - Rupture of a known earthquake fault, as delineated on the most recent Alquist–Priolo Earthquake Fault Zoning Map issued by the State Geologist for

the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.

- Strong seismic ground shaking?
- Seismic-related ground failure, including liquefaction?
- Landslides?

- Result in substantial soil erosion or the loss of topsoil?
- Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?
- Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?
- Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?

In the context of these questions from the CEQA Guidelines, the *City of Los Angeles CEQA Thresholds Guide* states that a project would normally have a significant geology and soils impact if the project would:

- Cause or accelerate geologic hazards, which would result in substantial damage to structures or infrastructure, or expose people to substantial risk of injury.
- Constitute a geologic hazard to other properties by causing or accelerating instability from erosion.
- Accelerate natural processes of wind and water erosion and sedimentation, resulting in sediment runoff or deposition which would not be contained or controlled on-site.
- One or more distinct and prominent geologic or topographic features would be destroyed, permanently covered, or materially and adversely modified as a result of the project. Such features may include, but are not limited to, hilltops, ridges, hillslopes, canyons, ravines, rock outcrops, water bodies, streambeds, and wetlands.

c. Project Design Features and Regulatory Compliance Measures

(1) Project Design Features

Project Design Feature E-1: Development of the Project Site shall comply with the construction and design recommendations provided in the site-specific geotechnical report.

(2) Regulatory Compliance Measures

Regulatory Compliance Measure E-1: Earthwork activities associated with the grading and export of soil shall occur in accordance with City requirements, as specified in the Los Angeles Building Code and CBC and through the grading plan review and approval process, including a haul route approval as specified in the LAMC.

Regulatory Compliance Measure E-2: Appropriate erosion control and drainage devices shall be provided to the satisfaction of the City of Los Angeles Department of Building and Safety through the grading plan review and approval process. These measures would include, but not be limited to, interceptor terraces, berms, vee-channels, and inlet and outlet structures, as specified by Section 91.7013 of the Los Angeles Building Code, including planting fast-growing annual and perennial grasses in areas where construction is not immediately planned.

Regulatory Compliance Measure E-3: Project building design and construction shall conform to the current building and safety design provisions of the LAMC, which incorporates the CBC, including all provisions related to seismic activity.

d. Project Impacts

Construction of the Project would be implemented as three separate components, each designed and timed to facilitate continued School operations on-site and minimize disruptions to neighbors. Specifically, development of the Project would commence with the North Wing Renovation, followed by two phases of development. Construction activities would include demolition, grading and excavation, and construction of new structures and related infrastructure. It is anticipated that the Project would result in the excavation of approximately 98,853 cubic yards of soil, of which approximately 258 cubic yards would be used for fill on-site and the remaining 98,595 cubic yards would be exported off-site. The maximum depth of excavation for Project development would be approximately 38 feet below ground surface.

(1) Geologic Hazards

The following discussion includes an analysis of whether the Project would cause or accelerate geologic hazards related to seismic hazards (including seismic-related ground failure), soil stability, expansive and corrosive soils, and groundwater.

(a) Seismic Hazards

(i) Surface Ground Rupture

Ground rupture is the visible breaking and displacement of the earth's surface along the trace of a fault during an earthquake. As discussed previously, no known active or potentially active faults underlie the Project Site. In addition, the Project Site is not located within a State-designated Alquist–Priolo Earthquake Fault Zone or City-designated fault rupture study area. Based on these considerations, the potential for surface ground rupture at the Project Site is considered low. As such, the Project would not cause or accelerate geologic hazards related to fault rupture, which would result in substantial damage to structures or infrastructure, or expose people to substantial risk of injury. Impacts associated with fault rupture would be less than significant and no mitigation measures are required.

(ii) Strong Seismic Ground Shaking

The Project Site is located within the seismically active region of Southern California and 25 known active faults and six known potentially active faults are located within 60 miles of the Project Site. Thus, the Project Site would be subject to strong seismic ground shaking, typical of areas within Southern California. The seismic exposure for the Project Site was analyzed in the Geotechnical Engineering Investigation. Specifically, based on information from CGS, the analysis indicated a 10 percent probability that peak ground acceleration (PGA) of 0.46g (0.46 times the acceleration of gravity) would be exceeded in 50 years in the Project area. In addition, the predominant earthquake, which has a moment magnitude of 6.6, contributes the majority of the ground motion to the Project Site. Based on information derived from the subsurface investigation, the Project Site is classified as Site Class D, which corresponds to a "Stiff Soil" Profile, according to Table 1613.5.2 of the 2010 California Building Code. This information and the Project Site coordinates were input into the USGS Ground Motion Parameter Calculator (Version 5.1.0) to calculate the Maximum Considered Earthquake (MCE) Ground motions for the Project Site. The Geotechnical Engineering Investigation determined that the MCE Ground motions are equivalent to the 2475-year recurrence interval ground motions adjusted by a deterministic limit, which is consistent with the 2009 International Building Code requirements. As such, the Project Site is not exposed to a greater than normal seismic risk compared to other areas of Southern California. This level of shaking is within the anticipated parameters for a well-designed structure.

As with any new development in the State of California, building design and construction for the Project would be required to conform to the current seismic design provisions of the CBC. The 2013 CBC incorporates the latest seismic design standards for structural loads and materials as well as provisions from the National Earthquake Hazards Reduction Program to mitigate losses from an earthquake and provide for the latest in earthquake safety. Additionally, construction of the Project would be required to adhere to the seismic safety requirements contained in the Los Angeles Building Code, which incorporates the California Building Code with City amendments for additional requirements.

Based on the above, the Project would not cause or accelerate geologic hazards related to strong seismic ground shaking, which would result in substantial damage to structures or infrastructure, or expose people to substantial risk of injury, and impacts associated with strong seismic ground shaking would be less than significant. Notwithstanding, Mitigation Measure E-1 is provided below to require the preparation of site-specific geotechnical reports prior to the issuance of building or grading permits that would include detailed geotechnical recommendations to address the site-specific conditions and construction and design requirements for the proposed buildings, including applicable seismic design parameters. With implementation of Mitigation Measure E-1, impacts associated strong seismic ground shaking would be further reduced.

(iii) Liquefaction

As discussed above, the Project Site is not located within a State-designated seismic hazard zone for liquefaction potential or within a City-designated liquefiable area or potentially liquefiable area. Furthermore, based on the site-specific liquefaction analysis performed as part of the Geotechnical Engineering Investigation, the soils underlying the Project Site would not be capable of liquefaction during the design earthquake with a moment magnitude of 6.6. Accordingly, the potential for liquefaction to occur at the Project Site is considered remote. Therefore, the Project would not cause or accelerate geologic hazards related to liquefaction, which would result in substantial damage to structures or infrastructure, or expose people to substantial risk of injury. As such, impacts associated with liquefaction would be less than significant and no mitigation measures are required.

(iv) Landslides

As previously described, the Project Site ranges in elevation from 495 feet on the northern boundary adjacent to Chaparal Street to 465 feet on the southern boundary adjacent to Sunset Boulevard. The steepest slope gradient found in the Project Site is approximately 5:1 horizontal to vertical, in a slope that is approximately four feet high. Therefore, while the Project Site is within a City-designated "cluster of small shallow surfacal landslides" area, the Geotechnical Engineering Investigation concluded that the probability of seismically induced landslides occurring on the Project Site would be low due to the general gentle slope gradient across the Project Site. In addition, the Project Site is not located within a State-designated seismic hazard zone for landslide potential. Therefore, the Project would not cause or accelerate geologic hazards related to landslides, which would result in substantial damage to structures or infrastructure, or expose people to substantial risk of injury. Impacts related to landslides would be less than significant and no mitigation measures are required.

(v) Settlement

Seismically induced settlement or compaction of dry or moist, cohesionless soils can result from earthquake ground motion. Such settlements are typically most damaging when the settlements are differential in nature across the length of structures. Some seismically induced settlement of structures within the Project Site should be expected as a result of strong ground shaking. However, due to the uniform nature of the underlying older alluvial soils, differential settlement would be considered negligible. Therefore, the Project would not cause or accelerate geologic hazards related to seismically induced settlement, which would result in substantial damage to structures or infrastructure, or expose people to substantial risk of injury. Impacts related to seismically induced settlement would be less than significant and no mitigation measures are required.

(vi) Tsunamis and Seiches

Tsunamis are large ocean waves generated by sudden water displacement caused by a submarine earthquake, landslide, or volcanic eruption. Due to the Project Site's elevation and distance from the ocean (approximately 4 miles), the Project Site would not be exposed to hazards from a tsunami. In addition, the Project Site is not located within an area that is designated by the City as having the potential to be impacted by a tsunami.[15] Therefore, the Project would not cause or accelerate geologic hazards related to seismically induced tsunamis, which would result in substantial damage to structures or infrastructure, or expose people to substantial risk of injury. Impacts related to tsunamis would be less than significant and no mitigation measures are required.

Seiches are large waves generated in enclosed bodies of water which can be caused by ground shaking associated with an earthquake. No major water-retaining

[15] *City of Los Angeles. General Plan Safety Element, Exhibit G, adopted by the City Council, November 26, 1996.*

structures or water bodies are located in the vicinity of the Project Site. In addition, review of the County of Los Angeles Flood and Inundation Hazards Map indicates that the Project Site does not lie within mapped inundation boundaries. As such, the Project would not cause or accelerate geologic hazards related to seismically induced seiches, which would result in substantial damage to structures or infrastructure, or expose people to substantial risk of injury. Impacts related to seiches would be less than significant and no mitigation measures are required.

(b) Soil Stability

The soils underlying the Project Site consist of fill and older alluvial deposits. The fill consists of mixtures of sand, silt, and clay and range from slightly moist to moist, loose to medium dense or medium firm to stiff, and fine grained with occasional gravel, slate fragments, and concrete fragments. The fill is then underlain by older alluvial soils consisting of inter-layered mixtures of sand, silt, and clay. The older alluvium ranges from slightly moist to moist, dense to very dense, stiff to very stiff, and fine to coarse grained with occasional gravel. Slate fragments were also found, varying from occasional to abundant. Based on on-site investigations, the depth of fill materials encountered on the Project Site varied between 1 and 5 feet. The anticipated maximum depth of excavation for Project development is approximately 38 feet below ground surface.

As described in the Geotechnical Engineering Investigation for the Project, the existing fill is considered to be unsuitable for support of foundations, concrete slabs, or additional fill. Therefore, mitigation is required. In accordance with Mitigation Measure E-2, provided below, existing fill materials and any fill generated during demolition would be removed and recompacted or excavated. For the proposed underground parking structure, the fill material would be removed by the proposed excavations. With implementation of Mitigation Measure E-2, the Project would not cause or accelerate geologic hazards related to unstable soils, which would result in substantial damage to structures or infrastructure, or expose people to substantial risk of injury, and impacts associated with unstable soils would be reduced to less than significant.

(c) Expansive Soils

The earth materials underlying the Project Site have yielded test results from the low to the high expansion potential ranges. Expansive soils are typically addressed through drainage control and increased reinforcing for foundations and concrete slabs-on-grade. The LAMC and CBC set forth specific minimum drainage and soil stability requirements for all projects. Compliance with regulatory requirements set forth by Mitigation Measure E-1 would minimize risk of damage to structures due to expansive soils. Therefore, with implementation of Mitigation Measure E-1, potential impacts related to expansive soils would be reduced to a level that is less than significant.

(d) Groundwater

As indicated above, groundwater was not encountered during exploration conducted to a maximum depth of 60 feet below the existing grade. In addition, California Geologic Survey data indicates the historically highest groundwater level within the Project Site is 40 feet below grade. Based on the maximum depth of excavation of approximately 38 feet below ground surface, no groundwater would be expected to be encountered during Project development. Therefore, impacts associated with groundwater would be less than significant and no mitigation measures are required.

(2) Sedimentation and Erosion

As discussed above, it is anticipated that the Project would result in the excavation of approximately 98,853 cubic yards of soil, of which approximately 258 cubic yards would be used for fill on-site and the remaining 98,595 cubic yards would be exported off-site. Sedimentation and erosion could potentially occur from exposed soils during Project construction. However, construction activities would occur in accordance with erosion control requirements, including grading and dust control measures, imposed by the City pursuant to grading permit regulations. Specifically, Project construction would comply with Los Angeles Municipal Code Chapter IX, which requires necessary permits, plans, plan checks, and inspections to ensure that the Project would reduce the sedimentation and erosion effects. In addition, as discussed further in Section IV.G, Hydrology, Surface Water Quality, and Groundwater, of this Draft EIR, the Project would be required to have an erosion control plan approved by the City of Los Angeles Department of Building and Safety, as well as a Storm Water Pollution Prevention Plan (SWPPP) pursuant to the National Pollutant Discharge Elimination System permit requirements. As part of the SWPPP, Best Management Practices (BMPs) would be implemented during construction to reduce sedimentation and erosion levels to the maximum extent possible. In addition, Project construction contractors would be required to comply with City grading permit regulations, which require necessary measures, plans, and inspections to reduce sedimentation and erosion. Furthermore, the Project would be required to have a Standard Urban Stormwater Mitigation Plan (SUSMP) in place during the operational life of the Project. The SUSMP would include BMPs that would reduce on-site erosion from vegetated areas on the Project Site. As such, with implementation of these requirements, which are reinforced as Regulatory Compliance Measure E-2 above and as Mitigation Measure E-3 and Mitigation Measure E-4 below, Project construction would not constitute a geologic hazard to other properties by causing or accelerating instability from erosion, or accelerate natural processes of wind and water erosion and sedimentation, resulting in sediment runoff or deposition which would not be contained or controlled on-site, and impacts related to sedimentation and erosion would be less than significant.

Please refer to Section IV.G, Hydrology and Water Quality, of this Draft EIR for a more detailed analysis regarding sedimentation and erosion effects during construction and operation of the Project.

(3) Landform Alteration

As described above, there are no distinct and prominent geologic or topographic features (i.e., hilltops, ridges, hillslopes, canyons, ravines, rock outcrops, water bodies, streambeds, or wetlands) on the Project Site or vicinity. Therefore, the Project would not destroy, permanently cover, or materially and adversely modify any distinct and prominent geologic or topographic features. Impacts associated with landform alteration would not occur and no mitigation measures are required.

4. Cumulative Impacts

Due to the site-specific nature of geological conditions (i.e., soils, geological features, seismic features, etc), geology impacts are typically assessed on a project-by-project basis, rather than on a cumulative basis. Nonetheless, cumulative growth through 2020 (inclusive of the 11 related projects identified in Section III, Environmental Setting, of this Draft EIR) would expose a greater number of people to seismic hazards. However, as with the Project, related projects and other future development projects would be subject to established guidelines and regulations pertaining to building design and seismic safety, including those set forth in the California Building Code and the Los Angeles Building Code. Therefore, with adherence to such regulations, cumulative impacts with regard to geology and soils would be less than significant.

5. Mitigation Measures

In addition to the project design features and regulatory compliance measures set forth above, the following mitigation measures are included to ensure that potential impacts related to geology and soils would be less than significant:

Mitigation Measure E-1: Prior to the issuance of building or grading permits, the Applicant shall submit a final design-level geotechnical, geologic, and seismic hazard investigation report that complies with all applicable state and local code requirements prepared by a qualified geotechnical engineer and certified engineering geologist. The report shall be submitted the Los Angeles Department of Building and Safety, consistent with City of Los Angeles requirements. The site-specific geotechnical report shall include recommendations for the specific building location and design including those pertaining to site preparation, fills and compaction, foundations, etc.

The site-specific geotechnical reports shall be prepared to the written satisfaction of the City of Los Angeles Department of Building and Safety.

Mitigation Measure E-2: During construction, non-engineered fills shall be excavated and replaced, as compacted fill properly bunched into suitable materials in accordance with City of Los Angeles requirements, or removed. The suitability of the excavated material for reuse in the compacted fills shall be confirmed during the final design-level, site specific geotechnical investigation.

Mitigation Measure E-3: Excavation and grading activities shall be scheduled during dry weather periods. If grading occurs during the rainy season (October 15 through April 1), diversion dikes shall be constructed to channel runoff around the site. Channels shall be lined with grass or roughened pavement to reduce runoff velocity.

Mitigation Measure E-4: Stockpiled and excavated soil shall be covered with secured tarps or plastic sheeting.

6. Level of Significance After Mitigation

With implementation of the project design features, regulatory compliance measures, and mitigation measures above, potential impacts related to geology and soils would be reduced to a level that is less than significant. In addition, cumulative impacts with regard to geology and soils would be less than significant.

Exhibit 5

COUNTY OF SAN DIEGO

GUIDELINES FOR DETERMINING SIGNIFICANCE

GEOLOGIC HAZARDS

LAND USE AND ENVIRONMENT GROUP

Department of Planning and Land Use
Department of Public Works

July 30, 2007

APPROVAL

I hereby certify that these **Guidelines for Determining Significance for Geologic Hazards** are a part of the County of San Diego, Land Use and Environment Group's Guidelines for Determining Significance and were considered by the Director of Planning and Land Use, in coordination with the Director of Public Works on the 30th day of July, 2007.

ERIC GIBSON
Interim Director of Planning and Land Use

JOHN SNYDER
Director of Public Works

I hereby certify that these Guidelines for Determining Significance for Geologic Hazards are a part of the County of San Diego, Land Use and Environment Group's Guidelines for Determining Significance and have hereby been approved by the Deputy Chief Administrative Officer (DCAO) of the Land Use and Environment Group on the 30th day of July, 2007. The Director of Planning and Land Use is authorized to approve revisions to these Guidelines for Determining Significance for Geologic Hazards except any revisions to the Guidelines for Determining Significance presented in Section 4.0 must be approved by the DCAO.

Approved, July 30, 2007

CHANDRA WALLAR
Deputy CAO

EXPLANATION

These Guidelines for Determining Significance for Geologic Hazards and information presented herein shall be used by County staff for the review of discretionary projects and environmental documents pursuant to the California Environmental Quality Act (CEQA). These Guidelines present a range of quantitative, qualitative, and performance levels for particular environmental effects. Normally (in the absence of substantial evidence to the contrary), non-compliance with a particular standard stated in these Guidelines will mean the project will result in a significant effect, whereas compliance will normally mean the effect will be determined to be "less than significant." Section 15064(b) of the State CEQA Guidelines states:

> "The determination whether a project may have a significant effect on the environment calls for careful judgment on the part of the public agency involved, based to the extent possible on factual and scientific data. An ironclad definition of significant effect is not always possible because the significance of an activity may vary with the setting."

The intent of these Guidelines is to provide a consistent, objective and predictable evaluation of significant effects. These Guidelines are not binding on any decision-maker and do not substitute for the use of independent judgment to determine significance or the evaluation of evidence in the record. The County reserves the right to modify these Guidelines in the event of scientific discovery or alterations in factual data that may alter the common application of a Guideline.

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List of Acronyms

AP	Alquist-Priolo
AP Zone	Alquist-Priolo Earthquake Fault Zone
CBC	California Building Code
CEQA	California Environmental Quality Act
CGS	California Geological Survey (formerly California Division of Mines and Geology)
CSR	Cyclic Stress Ratio
DMG	Division of Mines and Geology
FEMA	Federal Emergency Management Agency
FS	Factor of Safety
NEPA	National Environmental Policy Act
SEAOC	Structural Engineers Association of California
UBC	Uniform Building Code
USDA	United States Department of Agriculture
USGS	United States Geologic Survey

INTRODUCTION

This document provides guidance for evaluating adverse environmental effects that a proposed project may have from geological hazards. Specifically, this document addresses the following questions listed in the State CEQA Guidelines, Appendix G, Section VI., Geology and Soils:

Would the project:

a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:

   i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning map issued by the State Geologist for the area or based on other substantial evidence of a known fault?
   ii) Strong seismic ground shaking?
   iii) Seismic-related ground failure, including liquefaction?
   iv) Landslides?

c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?

d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?

1.0 GENERAL PRINCIPLES AND EXISTING CONDITIONS

Natural geologic processes that represent a hazard to life, health, or property are considered geologic hazards. Natural geologic hazards that affect people and property in San Diego County include earthquakes (which can cause surface fault rupture, ground shaking, and liquefaction), expansive soils, weathering, and mass wasting phenomena such as landslides and rockfalls. Although it is not possible to prevent or mitigate all geologic hazards, their destructive effects can be reduced to acceptable levels or avoided through appropriate site location and design.

1.1. <u>Fault Rupture</u>

During earthquakes the ground can rupture, either at or below the surface. Earthquakes can cause large vertical and/or horizontal displacement of the ground along the fault, and any structures built across a fault (or in very close proximity) may experience considerable damage or be completely destroyed in the event of surface fault rupture.

As shown on Figure 1, numerous faults have been mapped in San Diego County (Jennings, 1994 and Bryant, 2005). Each fault is classified based on its recency of movement as indicated below:

- Historic (movement within the last 200 years)
- Holocene (movement within the past 11,000 years)
- Late-Quaternary (movement within the past 700,000 years)
- Quaternary (age undifferentiated within the past 1.6 million years)
- Pre-Quaternary (movement older than 1.6 million years)

The source of mapping for some of the faults was of reconnaissance nature, and movement may have been more recent than indicated.

1.1.1 Alquist-Priolo Earthquake Fault Zones

The State of California has identified faults that represent a hazard of surface rupture as Alquist-Priolo Earthquake Fault Zones (AP Zones). While other active faults may exist, at least one fault within an AP Zone is known to have had active displacement within the Holocene (the last 11,000 years). Two main AP Zones extending from northwest to southeast across the northeast half of the County, the Elsinore and San Jacinto fault zones, present the highest threat of fault-rupture in the unincorporated portion of San Diego County (Figure 2).

1.1.2 County Special Study Zones

The Alquist-Priolo Act (AP Act) provides for a city or county to establish more restrictive policies than those within the AP Act, if desired. "Special Study Zones", which are late-Quaternary faults mapped by the California Division of Mines and Geology (DMG), have been designated by the County. Late-Quaternary faults (movement during the past 700,000 years) were mapped based on geomorphic evidence similar to that of Holocene faults except that tectonic features are less distinct. As indicated by the DMG, these faults may be younger, but the lack of younger overlying deposits precludes more accurate age classification. Traces of faults within "Special Study Zones" are treated by the County as active unless a fault investigation can prove otherwise. Figure 2 depicts Special Study Zones within the unincorporated portion of the County.

1.1.3 Quaternary and Pre-Quaternary Faults

It should also be noted that other faults have been mapped as Quaternary (age undifferentiated within the past 1.6 million years) or Pre-Quaternary (older than 1.6 million years) by the DMG and shown on Figure 1 (Jennings, 1994 and Bryant, 2005). The source of mapping for some of the faults was of reconnaissance nature, and movement may have been more recent than indicated. Therefore, there is potential that not all of these faults are necessarily inactive.

1.2 Ground Shaking

Ground shaking is the earthquake effect that results in the vast majority of damage. Several factors control how ground motion interacts with structures, making the hazard of ground shaking difficult to predict. Seismic waves propagating through the earth's crust are responsible for the ground vibrations normally felt during an earthquake. Seismic waves can vibrate in any direction and at different frequencies, depending on the frequency content of the earthquake, its rupture mechanism, the distance from the earthquake source, or epicenter, to an affected site, and the path and material through which the waves are moving. All of San Diego County is located within Seismic Zone 4 (Sec. 1629.4.1 of the CBC), which is the highest Seismic Zone, and like most of Southern California, is subject to ground shaking.

In 1997, the UBC incorporated Near-Source Zones for calculating base shear, which accounts for high ground motion and damage that have been observed within a few kilometers of historic earthquake ruptures. These Near-Source Zones were developed by the Strong Ground Motion Ad-Hoc Subcommittee of the Seismology Committee of the Structural Engineers Association of California (SEAOC).

As shown on Figure 3, several Near-Source Zones occur in the County. Active faults (faults which are known to have been active during Holocene time within the past 11,000 years) in the unincorporated portion of the County were classified as A or B in accordance with the criteria specified in 1997 UBC Table 16-U (DMG, 1998).

Type A faults are capable of producing magnitude 7.0 earthquakes or greater and have a high rate of seismic activity (a slip rate of at least 5 millimeters per year). Segments of the San Jacinto and Elsinore fault zones are included in this category. Near-source velocity effects need to be considered in the design of buildings within 15 kilometers of a Type A fault.

Type B faults are the majority of the rest of the seismogenic faults in California, and segments of the San Jacinto, Elsinore, and Rose Canyon fault zones are included in this category. Near-source velocity effects need to be considered in the design of buildings within 10 kilometers of a Type B fault.

1.3 Liquefaction

Liquefaction occurs primarily in saturated, loose, fine to medium-grained soils in areas where the groundwater table is generally 50-feet or less below the surface. When these sediments are shaken during an earthquake, a sudden increase in pore water pressure causes the soils to lose strength and behave as a liquid. In general, three types of lateral ground displacement are generated from liquefaction: (1) flow failure, which generally occurs on steeper slopes, (2) lateral spread, which generally occurs on gentle slopes, and (3) ground oscillation, which occurs on relatively flat ground. In addition, surface improvements on liquefiable areas may be prone to settlement and related damage in the event of a large earthquake on a regionally active fault. The primary factors that control the type of failure that is induced by liquefaction (if any) include slope, and the density, continuity, and depth of the liquefiable layer.

1.3.1 Liquefaction History

Liquefaction is not known to have occurred historically in San Diego County, although liquefaction has occurred in the Imperial Valley in response to earthquakes with a magnitude of 6 or higher (URS, 2004). Historically, seismic shaking levels within the County have not been sufficient to trigger liquefaction.

1.3.2 Potential for Liquefaction

Within the County, there may be a potential for liquefaction in areas with loose sandy soils combined with a shallow groundwater table, which typically are located in alluvial river valleys/basins and floodplains. The extent of risk areas within the County with a potential for liquefaction hazard was mapped in the *Multi-Jurisdictional Hazard Mitigation Plan, San Diego, CA* (URS, 2004, Figure 4.3.6). The data used to profile the risk of liquefaction hazard included:

- Probabilistic peak ground acceleration (PGA) data from the United States Geologic Survey (USGS);
- Scenario Earthquake Shake Map for Rose Canyon from the California Integrated Seismic Network (CISN);
- Existing liquefaction areas from local maps; and
- National Earthquake Hazards Reduction Program (NEHRP) which rates soils from hard to soft (Type A through Type E), with the hardest soils being Type A, and the softest soils rated at Type E.

Figure 4 depicts areas with the potential for liquefaction in the County, which includes the data from above and also includes mapped Quaternary Alluvium and hydric soils (soils that are often saturated and/or characteristic of wetlands).

Table 1 is a list of hydric soils in San Diego County based on the USDA Soil Survey categories (Bowman 1973):

Table 1
Hydric Soils in San Diego County

Category	Soil Type and Slope
ChA	Chino fine sandy loam, 0 to 2 percent slopes
CkA	Chino silt loam, saline, 0 to 2 percent slopes
InA	Indio silt loam, 0 to 2 percent slopes
IoA	Indio silt loam, saline, 0 to 2 percent slopes
IsA	Indio silt loam, dark variant
Lu	Loamy alluvial land
MoA	Mecca sandy loam, saline, 0 to 2 percent slopes
MxA	Mottsville loamy coarse sand, wet, 0 to 2 percent slopes
Rm	Riverwash
Tf	Tidal flats
TuB	Tujunga sand, 0 to 5 percent slopes
VaA	Visalia sandy loam, 0 to 2 percent slopes

Primary areas for potential liquefaction hazard include the lower San Dieguito, Sweetwater, and San Luis Rey River Valleys, Jacumba, Borrego Valley near the Borrego Sink, and parts of Ramona.

1.4 Landslides

Landslides occur when masses of rock, earth, or debris move down a slope, including rock falls, deep failure of slopes, and shallow debris flows. Landslides are influenced by human activities such as grading and other construction activities, irrigation of slopes, mining activity, etc. and by natural factors such as precipitation, geology/soil types, surface/subsurface flow of water, and topography. Frequently, they may be triggered by other hazards such as floods and earthquakes. Landslides result from one or more distinct failure surfaces at rates that vary from a few centimeters per day to tens of meters of instantaneous movement. In contrast, creep is the imperceptibly slow, steady, downward movement of slope-forming soil or rock. Creep can occur seasonally, where movement is within the depth of soil affected by seasonal changes in soil moisture and soil temperature, or can be continuous or progressive. Rockfalls or topples are usually sudden and occur on steep slopes. In a rock fall, rocks may fall, bounce, or roll down the slope. A topple occurs when part of a steep slope breaks loose and rotates forward.

The most common cause of a landslide is down slope gravitational stress applied to slope materials (overly steep natural slopes, cliffs, man-made cuts and fills, etc.). Another common cause includes excessive rainfall or irrigation on a cliff or slope. A type of soil failure is slope wash, from the erosion of slopes by surface-water runoff. Earthquakes can trigger rockfalls, rock avalanches, debris flows, or other types of potentially damaging landslide movements. Seismic induced landslides can occur under a broad range of conditions that include: (1) steeply sloping to nearly flat land; (2) bedrock, unconsolidated sediments, or fill; and (3) dry to very wet conditions.

1.4.1 Landslide History

Previous landslides and landslide-prone sedimentary formations are located in western portions of the unincorporated County. However, landslides can also occur in the granitic terrain in the eastern portion of the County, although they are less prevalent (URS, 2004). The majority of significant landslides that have occurred are along coastal bluffs and other areas within incorporated portions of the County (URS, 2004). Reactivations of existing landslides can be triggered by situations such as heavy rainfall or irrigation, seismic shaking, and/or grading.

1.4.2 Potential for Landslides

The DMG has a series of 1:24,000 scale landslide hazard zone maps published for the western portion of the County largely within the incorporated portion of the County. Most of the unincorporated portion of the County has not been mapped by the DMG. The maps overlap the unincorporated portion of the County in areas such as Rancho Santa Fe, Otay Mesa, Jamul, Lakeside, and Valley Center. However, the entire County was screened to profile the risk of landslides in the *Multi-Jurisdictional Hazard Mitigation Plan, San Diego, CA* (URS, 2004, Figure 4.3.5). The data used to profile the risk of landslides included:

- Steep slopes (greater than 25%);
- Soil Series data (SANDAG based on USGS 1970s series);
- Soil-slip susceptibility from USGS; and
- DMG Landslide Hazard Zone Maps

Figure 5 depicts areas with the potential risk of landslides in the County that includes the data from above and also includes gabbroic soils on slopes steeper than 15% in grade, which is a slide prone material.

1.4.3 Rockfall

Areas with the highest potential for rockfall are primarily within the steeply sloped granitic regions of the County. Projects that include steep slopes greater than 25% in grade with rock outcrops are particularly susceptible to rockfall hazards. No attempt to map these areas has been made due to the sporadic nature of boulders and rocks in various terrains throughout the unincorporated portion of the County.

1.5 Expansive Soils

Certain types of clay soils expand when they are saturated and shrink when dried. These are called expansive soils, and can pose a threat to the integrity of improvements that are built on them without proper engineering, especially if the appropriate design measures are not incorporated and the human activities resulting from the project causes the moisture content of the soils to change. These soils are derived primarily from weathering of feldspar minerals and volcanic ash.

Areas with potential to have expansive soils within the County occur predominately in the coastal plains, an area of dissected marine terraces and uplands. They can also be found in valleys and on slopes in the foothills and mountains of the Peninsular Ranges Region and, to a lesser extent, in the desert (Figure 6).

The expansion and contraction of the soil varies with the soil moisture content (wet or dry), and can be aggravated by the way a property is maintained or irrigated. In the United States it has been estimated that expansive soils inflict more than twice the combined damage from earthquakes, floods, tornados, and hurricanes (ASCE, 1997). These soil movements and the damage they cause generally occur very slowly and the damage is spread over a wide area.

Table 2 is a list of clay soils in San Diego County based on the USDA Soil Survey categories (Bowman 1973):

Table 2
Clay Soils in San Diego County

Category	Soil Type
Altamont	AtC, AtD, AtD2, AtE, AtE2, AtF
Auld	AwC, AwD, AyE
Boomer	BoC, BoE, BrE, BrG
Bosanko	BsC, BsD, BsE, BtC
Diablo	DaC, DaD, DaE, DaE2, DaF
Diablo-Olivenhain	DoE
Huerhuero	HrC
Las Posas	LpB, LpC, Lc2, Ld2, Le2, LrE, LrE2, LrG
Linne	LsE, LsF
Olivenhain	OhC
Redding	RdC, ReE
Salinas	SbA, SbC, ScA, ScB
Stockpen	SuA, SuB

1.6 Tsunamis and Seiches

A tsunami is a series of large waves that are caused by a sudden disturbance that displaces water. Triggers for a tsunami include earthquakes, submarine landslides, volcanic eruptions, or meteor impacts. The County's coastline is largely within incorporated cities and on Camp Pendleton and tsunamis would not be expected to affect lands in the unincorporated County.

A seiche is a standing wave in a completely or partially enclosed body of water. Areas located along the shoreline of lakes or reservoirs are susceptible to inundation by a seiche. The size of a seiche and affected inundation area is dependant on different factors including size and depth of the water body, elevation, source, and if man made, the structural condition of the body of water in which the seiche occurs. Seiches are most likely to occur within fault rupture zones due to ground shaking, or by the sudden movement of a landslide into a reservoir. A seiche could result in localized flooding or damage to low lying areas adjacent to large bodies of water.

For more information and guidelines to determine the significance of tsunamis and seiches on a project, refer to the County of San Diego Guidelines for Determining Significance for Hydrology.

2.0 EXISTING REGULATIONS AND STANDARDS

There are several existing regulations that have been enacted to alleviate the harmful effects from geologic hazards. The following list details the most significant Federal, State and local regulations that apply to San Diego County.

2.1 Federal Regulations and Standards

National Environmental Policy Act (NEPA) [Pub. L. 91-190, 42 U.S.C. 4321-4347, January 1, 1970, as amended by Pub. L. 94-52, July 3, 1975, Pub. L. 94-83, August 9, 1975, and Pub. L. 97-258, § 4(b), Sept. 13, 1982 http://www4.law.cornell.edu/uscode/42/ch55.html]
The National Environmental Policy Act of 1969 requires that geologic hazards be considered when assessing the environmental impact of proposed federal projects.

USGS Landslide Hazard Program [http://landslides.usgs.gov/index.html]
The United States Geologic Survey (USGS) in fulfillment of the requirements of Public Law 106-113 created this program. The Federal Emergency Management Agency (FEMA) is the responsible agency for the long-term management of natural hazards. The Federal government takes the lead role in funding and conducting research, whereas the reduction of losses due to geologic hazards is primarily a State and local responsibility.

2.2 State Regulations and Standards

California Environmental Quality Act (CEQA) [Public Resources Code 21000-21178; California Code of Regulations, Guidelines for Implementation of CEQA, Appendix G, Title 14, Chapter 3, §15000-15387 http://ceres.ca.gov/topic/env_law/ceqa/]
Under CEQA, lead agencies are required to consider impacts from geologic hazards. The CEQA Guidelines are concerned with assessing impacts associated with geologic hazards that exist or may be created by project implementation.

Alquist-Priolo Earthquake Fault Zoning Act (AP Act) [Public Resources Code, Division 2, Chapter 7.5, § 2621-2630 http://www.consrv.ca.gov/CGS/rghm/ap/ and http://www.leginfo.ca.gov]
The California Legislature, as a result of the devastation caused by the 1971 Sylmar earthquake, passed the AP Act in 1972. This State law requires that proposed developments incorporating tracts of four or more dwelling units investigate the potential for ground rupture within AP Zones. These zones serve as an official notification of the probability of ground rupture during future earthquakes. Where such zones are designated, no building may be constructed on the line of the fault, and before any construction is allowed, a geologic study must be conducted to determine the locations of all active fault lines in the zone. The act also provides that a city or county may establish more restrictive policies, if desired (Spangle, et al., 1988).

The AP Zones that the State of California has designated along active faults in the unincorporated portion of the San Diego County are:

Elsinore Fault: North of Pala, Palomar Mountain, Pauma Valley, Lake Henshaw, Julian, Banner Canyon, Mason Valley, Vallecito Valley, and Carrizo Valley.

Earthquake Valley Fault: San Felipe Valley and Sentenac Canyon.

San Jacinto Zone - Coyote Creek Fault: Borrego Valley and Ocotillo Wells.

Policies and Criteria of the State Mining and Geology Board with reference to the Alquist-Priolo Earthquake Fault Zoning Act [California Code of Regulations (CCR) Title 14, Section 3600 et seq. http://www.consrv.ca.gov/cgs/codes/ccr/t14/3600.htm]
This subchapter sets forth the policies and criteria of the State Mining and Geology Board that govern the government's responsibilities to prohibit the locations of developments and structures for human occupancy across the trace of active faults within AP Zones.

Seismic Hazards Mapping Act [Public Resources Code, Division 2, Chapter 7.8, § 2690-2699.6 http://www.consrv.ca.gov/CGS/rghm/ap/ and http://www.leginfo.ca.gov]
This Act passed by the State in 1990 addresses non-surface fault rupture earthquake hazards, including liquefaction and seismically induced landslides. No seismic hazard maps have been completed by the State for the County of San Diego.

Uniform Building Code [1997 edition published by the Western Fire Chiefs Association and the International Conference of Building Officials, and the National Fire Protection Association Standards 13 &13-D, 1996 Edition, and 13-R, 1996 Edition]
The Uniform Building Code (UBC) is the primary means for authorizing and enforcing procedures and mechanisms to ensure safe building standards. The UBC uses a hazard classification system to determine what protective measures are required to protect human health and property. To ensure that these safety measures are met, the UBC employs a permit system based on hazard classification.

California Building Code [2001 edition, California Code of Regulations (CCR), Title 24, California Building Standards, Part 2]
The California Building Code (CBC), which was most recently adopted in 2001 (effective November 1, 2002) is based largely on the 1997 UBC, with the addition of more stringent seismic provisions for hospitals, schools, and essential facilities.

2.3 Local Regulations and Standards

San Diego County General Plan, Seismic Safety Element (Part V)
[http://ceres.ca.gov/planning/counties/San_Diego/plans.html]
The Seismic Safety Element of the General Plan provides background information, policies, and measures for protection of the public from unreasonable risks associated with the effects of seismically induced surface rupture, ground shaking, ground failure, tsunami, seiche, slope instability leading to landslides, subsidence and other geologic hazards. Maps of known seismic and other geological hazards are included.

San Diego County Zoning Ordinance Fault Displacement Area Regulations, [Section 5400-5406, http://www.co.san-diego.ca.us/cnty/cntydepts/landuse/planning/zoning/]
County Zoning Ordinance Sections 5400-5406 implement the requirements of the Alquist-Priolo Act. The provisions of sections 5400-5406 outline the allowable development, the permitting requirements, and the construction limitations within Fault Rupture Zones, as designated by the Alquist-Priolo Act.

The County prohibits the following uses within AP Zones (Section 5404, Zoning Ordinance):

- Uses containing structures with a capacity of 300 people or more. Any use having the capacity to serve, house, entertain, or otherwise accommodate 300 or more persons at any one time.
- Uses with the potential to severely damage the environment or cause major loss of life. Any use having the potential to severely damage the environment or cause major loss of life if destroyed, such as dams, reservoirs, petroleum storage facilities, and electrical power plants powered by nuclear reactors.
- Specific civic uses. Police and fire stations, schools, hospitals, rest homes, nursing homes, and emergency communication facilities.

The County prohibits any buildings or structures to be used for human occupancy to be constructed over or within 50 feet of the trace of known fault (Section 5406, Zoning Ordinance). The County generally requires geologic reports for development proposed in AP Zones (Sec. 5406 b., Zoning Ordinance).

For a non-discretionary permit such as a building permit, the Department of Planning and Land Use, Building Division requires any above-surface structure to conform to the seismic requirements of the CBC and to incorporate the design recommendations contained within the soils and geologic report as required per the Code.

San Diego County Grading Ordinance, Chapter 4 – Design Standards and Performance Requirements [http://www.sdcounty.ca.gov/dpw/docs/propgradord.pdf]
Chapter 4 of the County Grading Ordinance (which commences at Section 87.101 of the County Code) includes requirements for the maximum slope allowed for cut and fill slopes, the requirement for drainage terraces on cut or fill slopes exceeding 40 feet in height, expansive soil requirements for cuts and fills, minimum setback requirements for buildings from cut or fill slopes, and reporting requirements including a soil engineer's report and a final engineering geology report by an engineering geologist, which includes specific approval of the grading as affected by geological factors.

3.0 TYPICAL ADVERSE EFFECTS

Geologic hazards have clearly definable physical effects. Earthquakes are a primary cause of geologic hazards in San Diego County and can impact extensive regions of land. Earthquakes can produce fault rupture and strong ground shaking, and can trigger landslides, rockfalls, soil liquefaction, tsunamis, and seiches. Overly steep slopes and/or water-saturated slopes are also common causes of landslides. In turn, these geologic hazards can lead to other hazards such as fires, dam failures, and toxic chemical releases.

Primary effects of earthquakes include violent ground motion, and sometimes permanent displacement of land associated with surface rupture. Earthquakes can snap and uproot trees, or knock people to the ground. They can also shear or collapse large buildings, bridges, dams, tunnels, pipelines and other rigid structures, as well as damage transportation systems, such as highways, railroads and airports.

Secondary effects of earthquakes include near-term phenomena such as liquefaction, landslides, fires, tsunamis, seiches and floods. Long-term effects associated with earthquakes include phenomena such as regional subsidence or emergence of landmasses and regional changes in groundwater levels.

While not as dramatic and life-threatening as earthquakes or landslides, expansive soils pose a threat to the structural integrity of buildings and other infrastructure, and in the United States expansive soils have caused more financial damage overall than any other geologic hazard.

3.1 Fault Rupture

Known active faults that represent a hazard of surface rupture have been identified by the State of California as AP Zones. As new geologic information becomes available the County may also zone other faults as "active," if necessary. Ground rupture can completely demolish structures by rupturing foundations or by tilting foundation slabs and walls, as well as damage buried and above ground utilities. Drinking water can be lost, and the loss of water lines or water pressure can affect emergency services, including fire fighting ability.

3.2 Ground Shaking

Ground shaking is the most common effect of earthquakes that adversely affects people, animals, and constructed improvements. People and animals can be knocked down and injured during ground shaking or killed by falling or sliding furniture and debris. Ground shaking can knock unanchored single family residences and mobile homes off their foundations. Chimneys with no reinforcing steel or those that are not secured to the main structure can topple or collapse. Ground shaking can cause landslides and rockfalls that can damage structures and infrastructure, and injure or kill people and animals.

The USGS (Marshall and Stein, 1994) identified the principal effects of the ground shaking in the 1994 Northridge earthquake as:

- Buildings damaged to the point where occupants were barred from entry;
- Bridge damage (minor to major) and collapsed bridges;
- Landslides;
- Ground cracking and surface faulting; and
- Liquefaction.

Any of these adverse effects could occur in San Diego County during ground shaking.

Another example would be the 1971 earthquake on the edge of the San Fernando Valley, where lower Van Norman Dam above the San Fernando Valley was severely damaged and on brink of catastrophic failure, threatening the lives of 80,000 people who evacuated their homes below the dam. Dams in San Diego County could be damaged or collapsed from ground shaking during a similar, large earthquake.

3.3 Liquefaction

Liquefaction occurs when saturated, unconsolidated sediments are violently shaken during an earthquake. This can cause a sudden increase in pore water pressure which in turn causes the soils to lose strength and behave as a liquid. Adverse effects of liquefaction include:

- Loss of bearing strength so that the ground loses its ability to support structures. Structures can be left leaning or they can collapse.
- Lateral spreading where the ground can slide on a buried liquefied layer. Buildings, roads, pipelines and other structures can be damaged.
- Sand boils of sand-laden water can be ejected from a buried liquefied layer and erupt at the surface. The surrounding ground often fractures and settles.
- Ground oscillation so that the surface layer, riding on a buried liquefied layer, is thrown back and forth by the shaking and can be severely deformed. The land, walkways, roads, highways, structures can all be shaken, broken, damaged and/or destroyed.
- Flotation to the surface of light-weight structures that are buried in the ground (e.g. pipelines, sewers, and nearly empty fuel tanks).
- Settlement when liquefied ground re-consolidates following an earthquake.

3.4 Landslides

Human use of slopes has led to both an increase in some landslide events, such as landslides on hillside development where slopes have been overly steepened or ancient landslides reactivated by increased loading, removal of buttressing material or saturation of a weak seam caused by changes in groundwater movement.

An example of a typical adverse effect of landslides is the loss of man-made structures, utilities and roads and/or loss of life by a landslide or rockfall that originated on an unstable area upslope of a home. Adverse effects vary with the size or volume of individual landslides/rockfall events and density of development below. The magnitude of such events can range from movement as small as a single boulder to massive movement of millions of cubic yards of material.

3.5 Expansive Soils

Construction of homes or other improvements on expansive soils can pose a threat to the integrity of structures that are built on them without proper engineering. These soil movements, and the damage they cause, generally occur very slowly and the damage can be spread over a wide area.

Expansive clay soils are known to cause adverse effects on a wide variety of structures and surface improvements. Expansive soil expands and contracts due to changes in the moisture content of the soil, causing structural problems through differential movement of the structure. If the moisture content and or soil type differs at various locations under the foundation, localized or non-uniform movement may occur in the structure. This movement can cause damage to the foundation and building structural system, evidenced by cracking of the slab or foundation, cracking in the exterior or interior wall coverings (indicating movement of support framing,) uneven floors and/or misaligned doors and windows. This type of movement is usually associated with slabs on-grade, but also occurs in structures with basements and crawlspaces.

A second effect of expansive soils is additional horizontal pressure applied to foundation walls found in basements and crawlspaces. Increased moisture in the soils adjacent to the foundation wall will cause the soils to expand, which will increase the lateral pressure applied to the foundation wall. If the foundation wall does not have sufficient strength, damage ranging from minor cracking, bowing (or other movement), to serious structural damage or failure of the wall may occur.

A third effect associated with clay soil is the movement of soils on slopes. Expansive clay soil, found as a layer under a more rigid top layer of soils, can become unstable as the moisture content increases, allowing the claystone and the top layers of soils to move. If the soil is located on a slope, the top layer of soil can creep (slow movement) down hill or even result in a landslide (sudden and dramatic movement along a distinct failure surface). Consequently, a residence or other structure with an inadequate foundation built on a slope subject to creeping may be damaged or destroyed depending on the severity of the slope. Adverse effects from creep also include curved tree trunks, bent fences or retaining walls, tilted poles or fences, and small soil ripples or ridges.

4.0 GUIDELINES FOR DETERMINING SIGNIFICANCE

This section provides guidance for evaluating adverse environmental effects from geologic hazards on a project. These Guidelines are organized into five subject areas based on the State CEQA Guidelines, Appendix G, Section VI, which addresses geologic hazards. The primary goal of these guidelines is to establish measurable standards for determining when an impact will be considered significant pursuant to CEQA.

The following significance guidelines should guide the evaluation of whether a significant impact from geologic hazards will occur as a result of project implementation. A project will generally be considered to have a significant effect if it proposes any of the following, absent specific evidence to the contrary. Conversely, if a project does not propose any of the following, it will generally not be considered to have a significant effect from geologic hazards, absent specific evidence of such an effect:

4.1 <u>Fault Rupture</u>

a. ***The project proposes any building or structure to be used for human occupancy over or within 50 feet of the trace of an Alquist-Priolo fault or County Special Study Zone fault.***

b. ***The project proposes the following uses within an AP Zone which are prohibited by the County:***

i. ***Uses containing structures with a capacity of 300 people or more.*** ***Any use having the capacity to serve, house, entertain, or otherwise accommodate 300 or more persons at any one time.***

ii. ***Uses with the potential to severely damage the environment or cause major loss of life.*** ***Any use having the potential to severely damage the environment or cause major loss of life if destroyed, such as dams, reservoirs, petroleum storage facilities, and electrical power plants powered by nuclear reactors.***

iii. ***Specific civic uses.*** ***Police and fire stations, schools, hospitals, rest homes, nursing homes, and emergency communication facilities.***

Significance Guidelines 4.1.a and 4.1.b address question a) i) of Section VI of Appendix G of the State CEQA Guidelines. Specific criteria of the State Mining and Geology Board in reference to the AP Act states that unless a geologic investigation can prove otherwise, the area within 50 feet of the trace of an AP fault shall be presumed to be underlain by active branches of that fault and no structures shall be permitted in this area. In accordance with the County Zoning Ordinance, these guidelines further restrict development for human habitation to have at least a 50 foot setback from the trace of an AP fault. Exemptions to these guidelines are noted within Section 5406 of the County Zoning Ordinance as follows:

1. Buildings and structures not intended or used for human occupancy.
2. Alterations or repairs to an existing structure provided that the aggregate value of the work performed does not exceed 50-percent of the value of the existing structure and does not adversely affect the structural integrity of the existing structure.
3. A single-family wood frame dwelling not exceeding 2-stories in height which is built or located as part of a development of less than four (4) such dwellings. (***Important Note:*** *This exemption is based on an exemption allowed within the AP Act. It should be clear while this exemption exists, the County will not allow any new single-family wood frame dwellings to be placed over the trace of an active fault.)*
4. A mobile home whose body width exceeds 8-feet.
5. Swimming pools, decorative walls, fences, and minor work of a similar nature.

Significance Guideline 4.1.b is in accordance with Fault Displacement Area regulations within the County Zoning Ordinance. Each of the above significance guidelines is stricter than the guidelines within the AP Act. Section 2624 of the Alquist-Priolo Earthquake Fault Zoning Act (AP Act) (Public Resources Code Division 2, Chapter 7.5, Section 2624) provides authority to counties to adopt policies stricter than those established by the AP Act or the State Mining and Geology Board. The County adopted these as conservative measures to further protect human life, structures, and the environment.

4.2 Ground Shaking

The project site is located within a County Near-Source Shaking Zone or within Seismic Zone 4 and the project does not conform to the Uniform Building Code (UBC).

Significance Guideline 4.2 addresses question a) ii) of Section VI of Appendix G of the State CEQA Guidelines and relies upon conformance to the UBC Seismic Hazards Standards for construction within areas prone to ground shaking. The entire County is within Seismic Zone 4 and is subject to seismic ground shaking. Near-Source Shaking Zones have been defined predominately along the Elsinore and San Jacinto fault zones in the eastern portions of the unincorporated portion of the County. Inevitably, all construction projects in the County may be affected by seismic shaking; therefore, construction design standards have been developed to ensure structures perform in a predictable manner during seismic events. The last few decades have produced significant strides in structural design methodologies that have been incorporated into local building codes, lowering risks associated with large seismic events.

4.3 Liquefaction

The project site has potential to expose people or structures to substantial adverse effects because:

i. ***The project site has potentially liquefiable soils; and***

ii. ***The potentially liquefiable soils are saturated or have the potential to become saturated; and***

iii. ***In-situ soil densities are not sufficiently high to preclude liquefaction.***

Significance Guideline 4.3 addresses question a) iii) of Section VI of Appendix G of the State CEQA Guidelines and the portion of question c) that addresses on-site and off-site lateral spreading or liquefaction. There are a number of factors necessary to determine if there is a potential liquefaction hazard at a project site. An affirmative response to all of the criteria in the guidelines would be considered a significant impact. This significance guideline relies on guidance provided by the State Department of Mines and Geology Special Publication 117, *Guidelines for Evaluating and Mitigating Seismic Hazards in California.* This document provides detailed information regarding assessment of potential liquefaction hazards as well as mitigation measures which can be employed to reduce hazards to levels that would be considered less than significant.

4.4 Landslides

a. ***The project site would expose people or structures to substantial adverse effects, including the risk of loss, injury, or death involving landslides.***

b. ***The project is located on a geologic unit or soil that is unstable, or would become unstable as a result of the project, potentially resulting in an on- or off-site landslide.***

c. ***The project site lies directly below or on a known area subject to rockfall which could result in collapse of structures.***

Significance Guidelines 4.4.a through 4.4.c address question a) iv) of Section VI of Appendix G of the State CEQA Guidelines and the portion of question c) that relates to on- or off-site landslide or collapse. If any Guideline listed under 4.4 has an affirmative response, the impact would be significant. If a project site is located on or within 500 feet of a "Landslide Susceptibility Area" as depicted on Figure 5, a Geologic Reconnaissance Report may be required to evaluate the risk of landslides or rockfall and to determine if the project may have a significant impact. Up to a 1,000 foot buffer area around project sites may be required to be evaluated to determine if potential off-site hazards are present which could affect the project.

A Geologic Reconnaissance Report will evaluate whether there are any risks to people or property from landslides or rockfall. If the Geologic Reconnaissance Report indicates a potentially significant impact from potential landslides or rockfall, feasible mitigation or design measures (as discussed in Section 5) should be included that would reduce potentially significant impacts to levels below significance. A Geologic Investigation may be required to provide a more comprehensive evaluation for the potential of landslides or rockfall and to provide engineering design measures to mitigate impacts.

4.5 Expansive soils

The project is located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), and does not conform with the Uniform Building Code.

Significance Guideline 4.5 addresses question d) of Section VI of Appendix G of the State CEQA Guidelines. Soils are expansive if the amount of clay and predominant clay mineral is greater than 30% mixed or montmorillonitic clays (United States Department of Agriculture, Part III, San Diego Soil Survey, 1973).

This significance guideline relies upon conformance to the Uniform Building Code's Expansive Soil Standards for construction on soils that are within a high shrink/swell category as defined by the U.S. Department of Agriculture (USDA), San Diego Soil Survey. Expansive soils are present throughout San Diego County. Inevitably most construction projects in San Diego County may be affected by expansive soils; therefore, construction standards have been developed to ensure structures can withstand changes in the integrity of the soil. Structural engineering standards have been incorporated into the UBC, lowering associated risks.

5.0 STANDARD MITIGATION AND PROJECT DESIGN CONSIDERATIONS

A project will be evaluated for its effect on geologic hazards under the criteria specified in Section 4.0. If mitigation or project design considerations are identified that could reduce a significant effect, those shall be incorporated into the project. While project design elements and/or mitigation shall be incorporated into a project, it may not always be possible to reduce the impact to less than significant. In general, if mitigation or project redesign does not reduce a significant impact to geologic hazards to less than significant, the impact will be considered significant and unmitigable.

Any above ground structure is required to comply with the structural parameters set forth within the most current edition of the UBC. If the area is located within a zone that will be affected by ground shaking from a seismic event or is located within an area that has high shrink-swell soils, compliance with the structural and engineering standards set forth within the UBC will be required as project design considerations. Building to the UBC guidelines will mitigate most impacts to less than significant. The following are additional mitigation measures as outlined by the California Department of Conservation, Geological Survey, Special Publication 117, 1997.

5.1 Fault Rupture Hazard

The hazard assessment required for project sites within zones of required investigation should successfully determine (a) the location or absence of hazardous faults on or adjacent to the site; and the ages of past rupture events, (b) the distribution of primary and secondary faulting, (c) the probability of, or relative potential for future surface displacement, and (d) the degree of confidence in and limitations of these conclusions.

Avoidance is the primary goal for hazards relating to fault rupture zones. The County requires that no structure for human occupancy shall be permitted to be placed across the trace of an active fault and that there is at least a 50-foot setback from the trace of an active fault for such structures. If the trace of the fault is inferred through portions of the project site, the setback distance will depend on the quality of data and type and complexity of fault(s) encountered at the site. The setbacks required on areas of indirect interpretive methods will be more restrictive than the above-discussed 50-foot setback.

5.2 Ground Shaking Hazard

Hazards associated with ground shaking are mitigated through following the UBC Seismic Hazards Standards for construction within a County Near-Source Seismic Shaking Zone or Seismic Zone 4. Inevitably most construction projects in the County may be affected by seismic shaking; therefore, construction standards have been developed to ensure structures can withstand seismic events. The last decade has produced significant strides in structural engineering that have been incorporated into the UBC, lowering associated risks. Effective design measures include constructing earth fills to partially absorb underlying ground movements; isolating foundations from the underlying ground movements; and designing strong, ductile foundations that can accommodate some deformation without compromising the functionality of the structure. (Bray and Kelson, 2006).

5.3 Liquefaction Hazard

The hazard assessment required for project sites within areas of required investigation should (a) demonstrate that liquefaction at a proposed project site poses a sufficiently low hazard as to satisfy the defined acceptable level of risk criteria, or (b) result in implementation of suitable mitigation recommendations to effectively reduce the hazard to acceptable levels. Mitigation should provide a suitable level of protection with regard to potential lateral spread failures, and more localized problems including bearing failure, settlements, and lateral displacement. The scope and type(s) of mitigation required depend on the site conditions present and the nature of the proposed project.

5.4 Landslide Hazard

For any existing or proposed slopes that are determined to be unstable, appropriate mitigation measures will be provided before the project is approved. The hazards these slopes present can be mitigated in one of three ways:

5.4.1 Avoid the Hazard

Where the potential for failure is beyond the acceptable level and not preventable by practical means, the hazard should be avoided. Developments should be built sufficiently far away from the threat so they will not be affected if the slope fails.

5.4.2 Protect the Site from the Hazard

While it is not always possible to prevent slope failures occurring above a project site, it is sometimes possible to protect the site from the runout of failed slope materials. This is particularly true for sites located at or near the base of steep slopes, which can receive large amounts of material from shallow disaggregated landslides or debris flows. These methods include catchments and/or protective structures such as basins, embankments, diversion or barrier walls, and fences.

5.4.3 Reduce the Hazard to an Acceptable Level

Unstable slopes affecting a project can be rendered stable (that is, by increasing the factor of safety to >1.5 for static and 1.1 for dynamic loads) by eliminating or reducing the slope, removing the unstable soil and rock materials, or applying one or more appropriate slope stabilization methods (such as buttress fills, sub drains, soil nailing, crib walls, etc.) For deep-seated slope instability, strengthening the design of the structure (e.g., reinforced foundations) is generally not by itself an adequate mitigation measure.

Lastly, project sites that are outside of a zone of required investigation may be affected by ground-failure run out from adjacent or nearby slopes. Any proposed mitigation should address all recognized significant off-site hazards.

6.0 REPORTING REQUIREMENTS

The general outlines for the typical types of reports that may be required in lands designated within Geologic Hazard Zones or Areas are included in Attachment A. A California Certified Engineering Geologist shall complete the report. As discussed in Attachment A, projects may require a Geologic Reconnaissance Report or a more detailed Geologic Investigation depending on the type of potential geologic hazard(s) present on a particular project site.

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Figure 1 – Mapped Faults in San Diego County

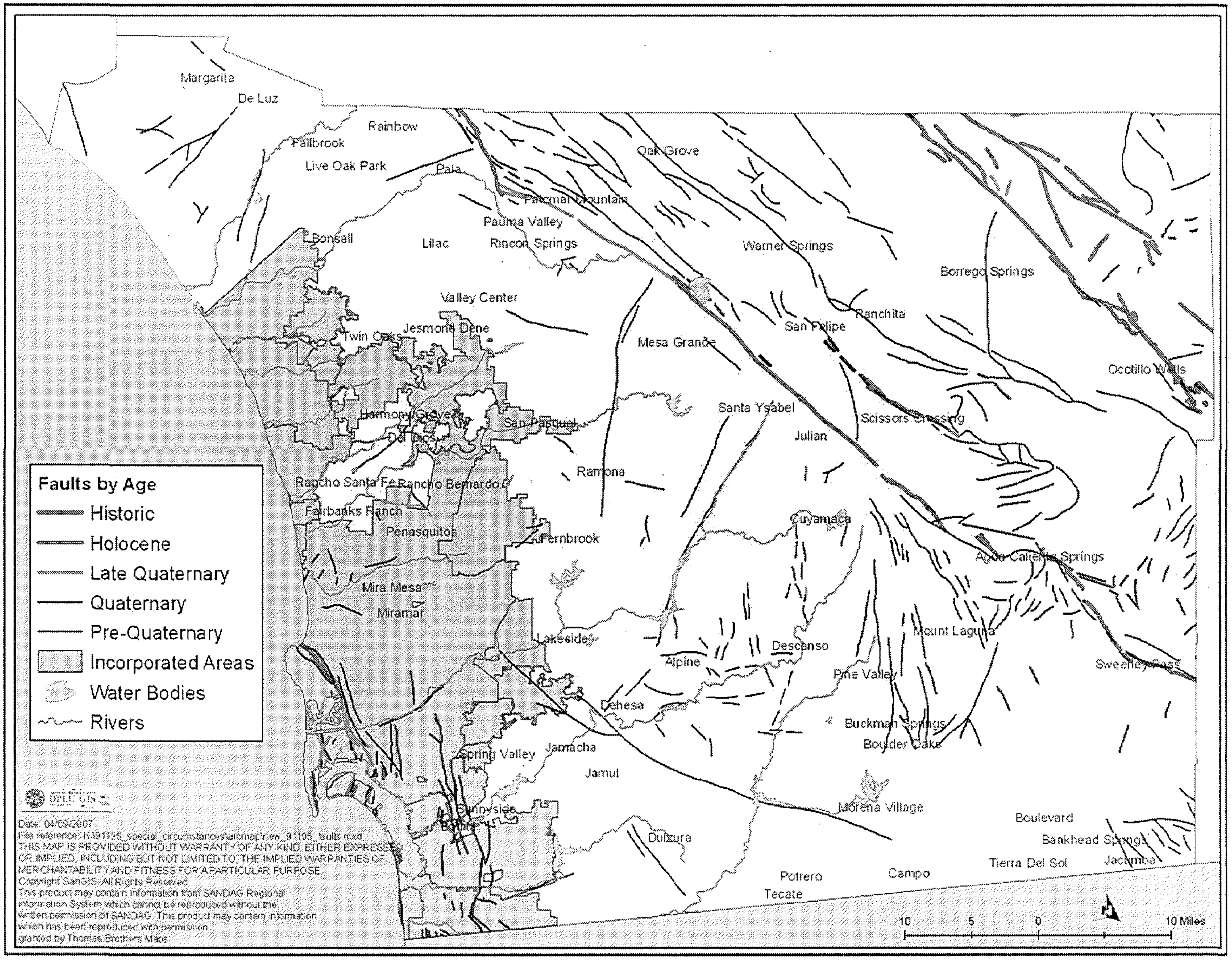


Figure 2 – Alquist-Priolo and County Special Study Fault Zones

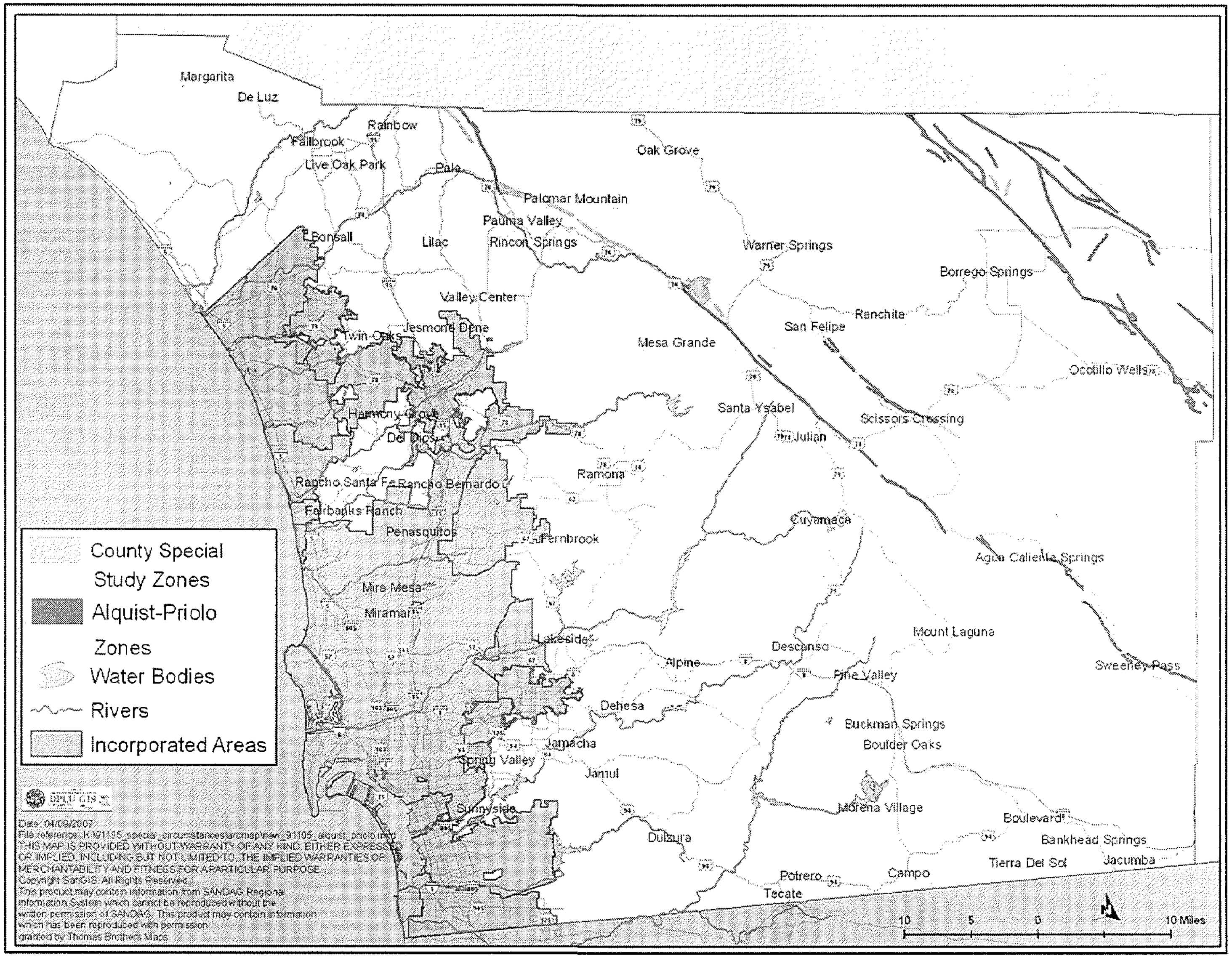


Figure 3 – Near-Source Shaking Zones

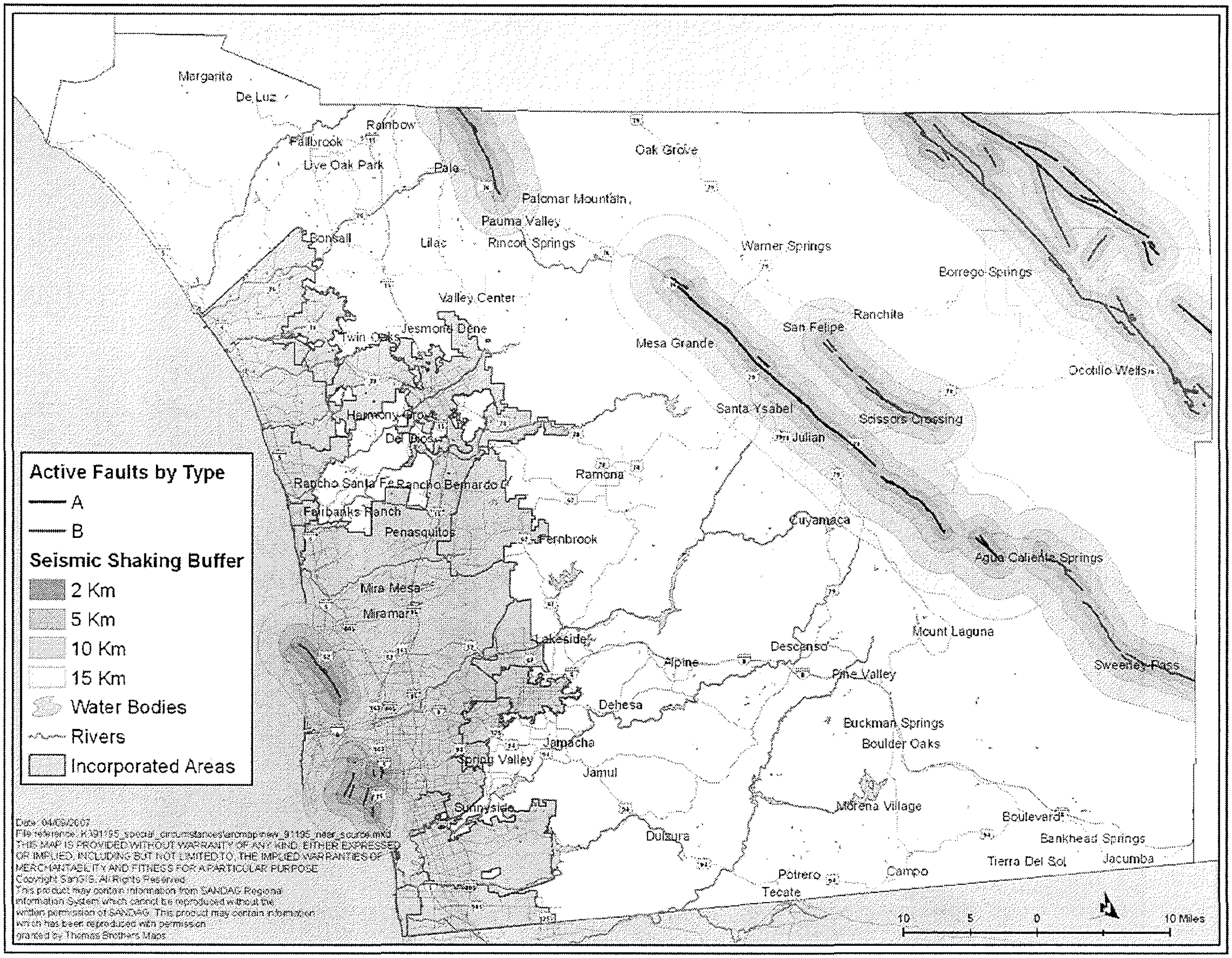


Figure 4 – Potential Liquefaction Areas

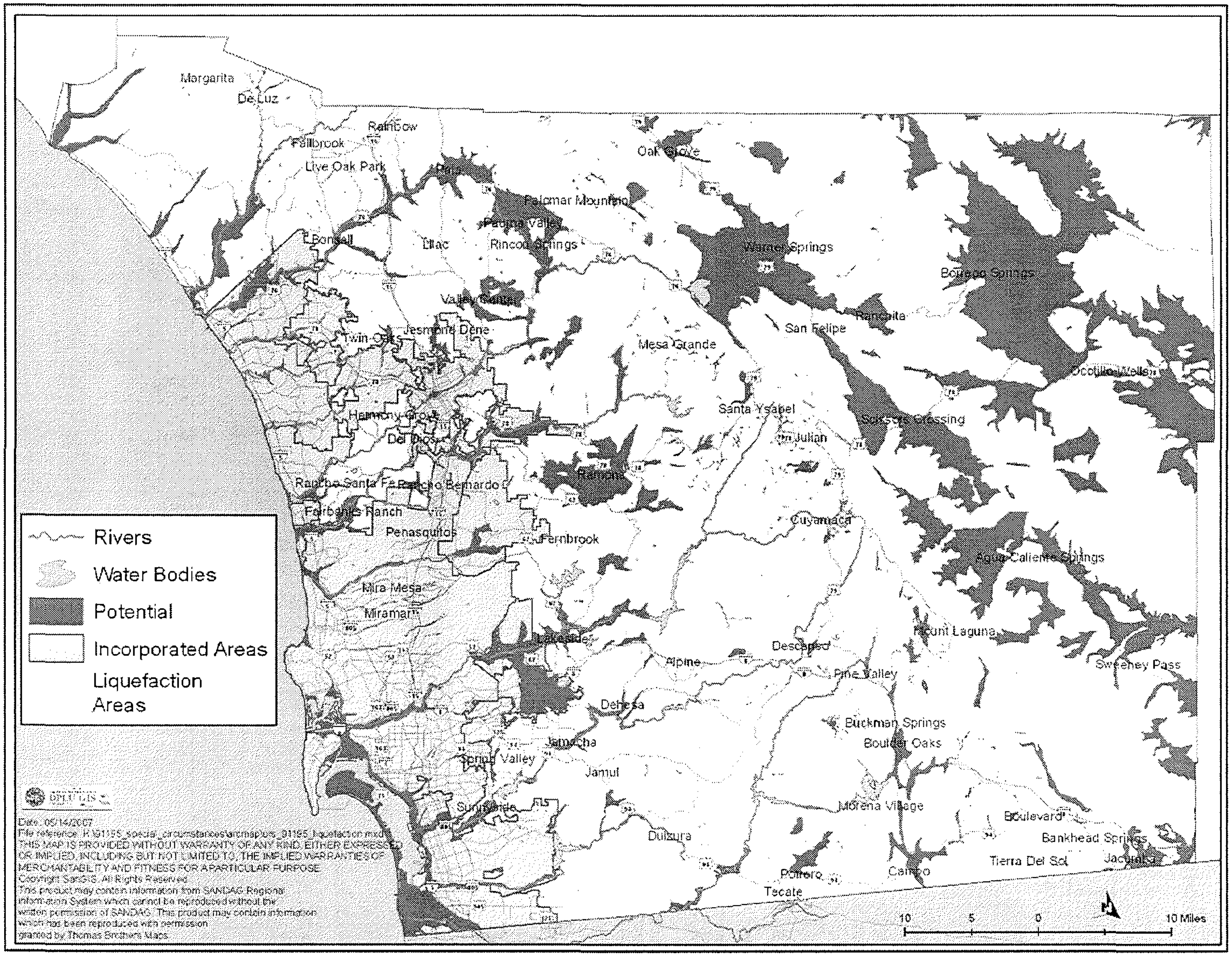


Figure 5 – County Landslide Susceptibility Areas

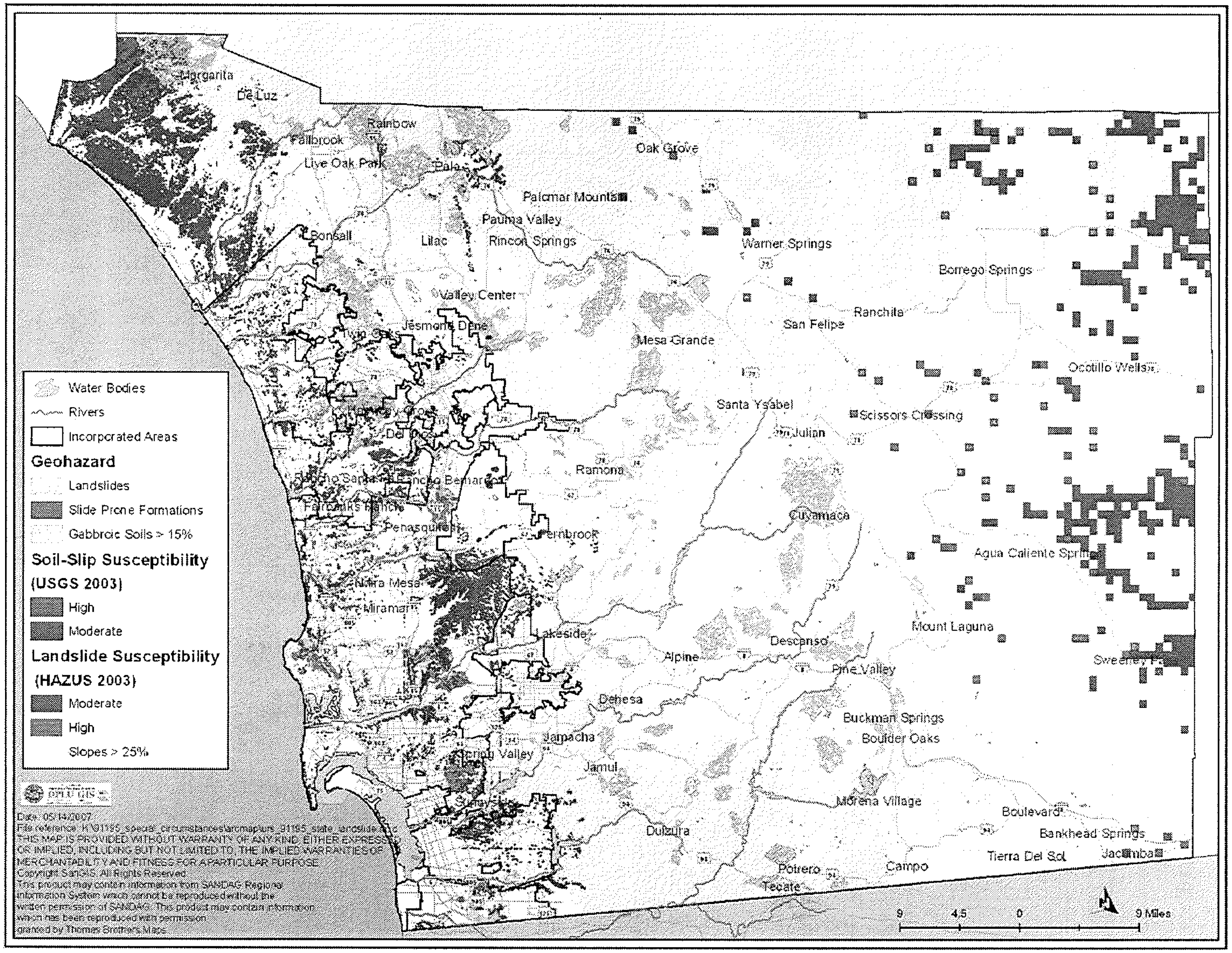
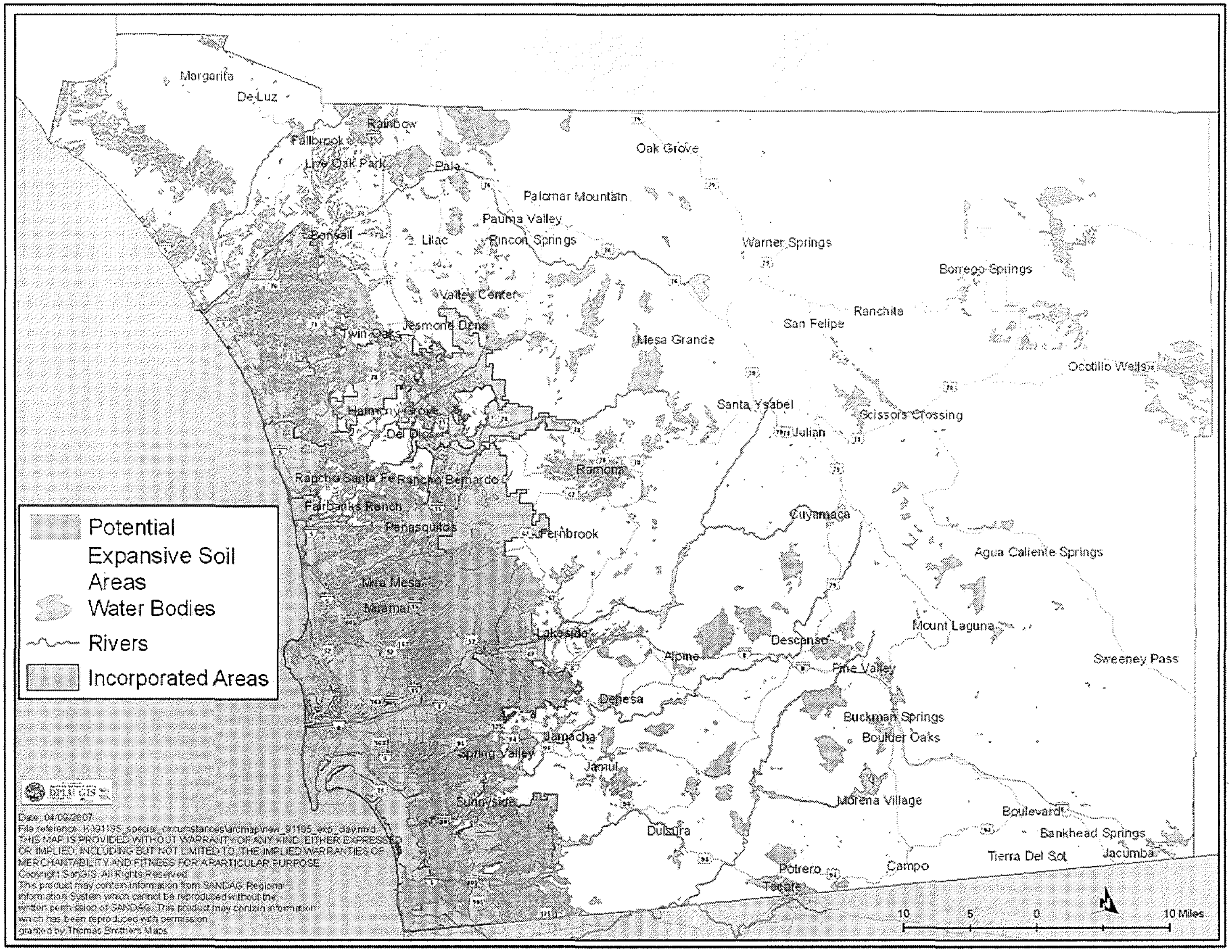


Figure 6 – Potential Expansive Soil Areas



[ATTACHMENT A]

DEFINITIONS

Creep – The slow, steady, downward movement of slope-forming soil or rock.

Crust – The thin, solid, outermost layer of the Earth.

Debris avalanche – A very rapidly moving debris flow.

Debris flow – A landslide made up of a mixture of water-saturated loose soil, rock, organic matter, and air, with a consistency similar to wet cement. Debris flows move rapidly downslope under the influence of gravity. Sometimes referred to as earthflows or mudflows.

Earthflow – See debris flow.

Earthquake – A sudden ground motion or vibration of the Earth, produced by a rapid release of stored-up energy. Includes sudden slip on a fault and the resulting ground shaking and radiated seismic energy caused by the slip.

Fault – A fracture in the Earth along which one side has moved in relative to the other.

Fault Trace – Intersections of faults on the ground surface (horizon); also called fault line

Gabbro – Rock composed of olivine, pyroxene, and plagioclase and having a high clay content. Gabbro is the coarse-grained equivalent of basaltic rocks.

Landslide – The downslope movement of rock, soil, or mud.

Lateral spread – A landslide on a gentle slope, with rapid, fluid-like movement.

Liquefaction – A process by which water-saturated soil temporarily loses strength and acts as a fluid.

Montmorillonite – A very soft mineral of typically microscopic crystals that form a clay. It is the main constituent of the volcanic ash weathering product, bentonite. Montmorillonite's water content is variable and it increases greatly in volume when it absorbs water.

Mudflow – See debris flow.

Plates – Thick, moving slabs of rock composed of crust and the uppermost layer of the under lying mantle.

Richter Magnitude Scale – A measure of an earthquake's size. It describes the total amount of energy released during an earthquake. In the 1930's, C.F. Richter devised a way measure the magnitude of an earthquake using an instrument called a seismograph to measure the speed of ground motion during an earthquake. Geologists discovered that the energy released in an earthquake goes up with magnitude faster than the ground speed by a factor of 32.

Rockfall – Falling, bouncing, or rolling of rocks and/or debris down a steep slope.

Runout – The area where one curved surface merges with another, such as at the bottom of a slope.

Seiche – The sloshing of a closed body of water as a result of an earthquake.

Shear – That type of force that causes or tends to cause two contiguous parts of the same body to slide relative to each other in a direction parallel to their plane of contact.

Seismic – Referring to earthquakes.

Seismogenic – Earthquake producing.

Subduction Zone – Also called a convergent plate boundary. An area where two plates meet and one is pulled beneath the other.

Topple – A landslide where part of a steep slope breaks loose and falls forward.

Tsunami – A large wave or series of waves that are caused by a sudden disturbance that displaces water. The usual cause is an earthquake, submarine landslide, volcanic eruption, or meteor impact.

[ATTACHMENT B]

GUIDELINES FOR THE PREPARATION OF GEOLOGIC REPORTS FOR DISCRETIONARY LAND USE PERMITS

The purpose of these guidelines is to establish format and content requirements of geologic reports required by the County of San Diego Department of Planning and Land Use for projects undergoing CEQA Review. The type of report required depends on the scope of the project and its compatibility with existing geologic conditions. In general, Geologic Investigation or Geologic Reconnaissance Reports may be required for projects located within a potential hazard zone or area. A California Certified Engineering Geologist shall complete the report.

1.0 GEOLOGIC INVESTIGATION

Fault Rupture
Project sites located within an Alquist-Priolo Fault Rupture Zone or a County Special Study Zone may be required to conduct a Geologic Investigation that conforms to the California Geologic Survey's *Guidelines for Evaluating the Hazard of Surface Fault Rupture* and the California Board of Geologists and Geophysicists *Geologic Guidelines for Earthquake and/or Fault Hazard Reports.* The guidelines can be downloaded at the following web addresses:
http://www.consrv.ca.gov/cgs/information/publications/cgs_notes/note_49/note_49.pdf
http://www.geology.ca.gov/publications/earthquake.pdf

The specific requirements to be included in the Geologic Investigation will be determined by the County on a project-by-project basis.

2.0 GEOLOGIC RECONNAISSANCE REPORTS

A Geologic Reconnaissance Report may be required for project sites to address potential geologic hazards concerning risks of fault rupture, liquefaction, and landslides (including rockfall) as discussed below. If multiple hazards exist on or near a project site, a single reconnaissance report would be appropriate to cover all potential geologic hazards present. At the time of the project's initial evaluation, the County may determine that additional information needs to be included in the geologic reconnaissance beyond the minimum requirements discussed below.

Fault Rupture
Project sites located within zones of faults mapped as Quaternary or pre-Quaternary by the DMG may be required to conduct a Geologic Reconnaissance of the project site. The reconnaissance report shall conform to the California Board of Geologists and Geophysicists *Geologic Guidelines for Earthquake and/or Fault Hazard Reports.* The guidelines can be downloaded at the following web address:
http://www.geology.ca.gov/publications/earthquake.pdf

At a minimum, the Geologic Reconnaissance Report should include a review of topographic maps, geologic and soil engineering maps and reports (if available), stereoscopic aerial photographs, and other published and non-published references. A field visit may be necessary to fill in information in questionable areas, and to observe surface features and details that could not be determined from other data sources.

Although engineering design recommendations are generally not a required component of a Geologic Reconnaissance Report, feasible measures to mitigate potential impacts from fault rupture to levels below significance, and environmental design considerations (where appropriate), should also be discussed.

Suspected geologic problems that cannot be evaluated except through in-depth investigation should be clearly described in the report. If the Geologic Reconnaissance Report recommends further investigation, a Geologic Investigation must be prepared. The specific requirements to be included in a Geologic Investigation will be determined by the County on a project-by-project basis.

Liquefaction

Project sites located within a "Potential Liquefaction Area" may be required to conduct a Geologic Reconnaissance Report. As a first screening, the depth to groundwater should be determined for the project site. If the highest groundwater level for the project site is determined to be deeper than 50 feet below the existing ground surface or proposed finished grade (whichever is deeper), no further assessment of potential liquefaction is required.

For projects where the highest groundwater level for the project site is determined to be less than 50 feet, further screening of potential liquefaction is required and the report shall follow guidelines in the California Geologic Survey's *Guidelines for Evaluation and Mitigating Seismic Hazards in California, Special Publication 117, Chapter 6 – Analysis and Mitigation of Liquefaction Hazards.* These guidelines can be downloaded from the California Department of Conservation's Geologic Survey website:
http://gmw.consrv.ca.gov/shmp/webdocs/sp117.pdf

Although engineering design recommendations are generally not a required component of a Geologic Reconnaissance Report, feasible measures to mitigate potential impacts from liquifaction to levels below significance, and environmental design considerations (where appropriate), should also be discussed.

Suspected geologic problems that cannot be evaluated except through in-depth investigation should be clearly described in the report. If the Geologic Reconnaissance Report recommends further investigation, a Geologic Investigation must be prepared. The specific requirements to be included in a Geologic Investigation will be determined by the County on a project-by-project basis.

Landslides or Rockfalls
Project sites located on or within 500 feet of a "Landslide Susceptibility Area" may be required to conduct a Geologic Reconnaissance Report. The reconnaissance report shall conform to the California Board of Geologists and Geophysicists *Guidelines for Engineering Geologic Reports*. The guidelines can be downloaded at the following web address:
http://www.geology.ca.gov/publications/engineering.pdf

At a minimum, the Geologic Reconnaissance Report should include a review of topographic maps, geologic and soil engineering maps and reports (if available), stereoscopic aerial photograph review, and other published and non-published references. Aerial photographs can be useful in identifying potential landslide features. Several sets of stereoscopic aerial photographs that pre-date project site area development taken at different times of the year are particularly useful in identifying subtle geomorphic features. A field visit will likely be necessary to fill in information in questionable areas, to address the potential risk of rockfall to the project site, and to observe surface features and details that could not be determined from other data sources.

Although engineering design recommendations are generally not a required component of a Geologic Reconnaissance Report, feasible measures to mitigate potential impacts from landslides or rockfall to levels below significance and environmental design considerations (where appropriate), should also be discussed.

Suspected geologic problems that cannot be evaluated except through in-depth investigation should be clearly described in the report. If the Geologic Reconnaissance Report recommends further investigation, a Geologic Investigation must be prepared. The specific requirements to be included in a Geologic Investigation will be determined by the County on a project-by-project basis.

Exhibit 6

SUBJECT

FAULT-RUPTURE HAZARD INVESTIGATION AND REPORT STANDARDS

APPROVED, Barbara Johnston, Building Official

The Alquist-Priolo Earthquake Fault Zoning Act is intended to provide policies and criteria to assist cities, counties, and state agencies in the exercise of their responsibility to prohibit the location of developments and structures for human occupancy across the trace of active faults. The Act allows cities and counties to establish additional policies and criteria so long as they are not less restrictive. These include setting specific investigation and report standards.

Generally, fault rupture hazard investigations and associated reports must adhere to the guidelines outlined in California Geological Survey (CGS) Note 49 entitled "Guidelines for Evaluating the Hazard of Surface Fault Rupture", with Appendix C of CGS Special Publication 42 entitled "Fault-Rupture Hazard Zones in California" and with Chapter 82.15 of the County Development Code.

The policies and criteria outlined in this standard procedure are intended to clarify County requirements and augment the State guidelines.

1. Trenches and/or other exposures in Quaternary age alluvium must provide adequate subsurface coverage for that portion of the project proposed within the Alquist-Priolo Earthquake Fault Zone or, when approved by the County Geologist, for individual building envelopes within the Alquist-Priolo Earthquake Fault Zone.

2. In determining the amount of subsurface coverage provided by widely spaced trenches and/or other exposures in Holocene age alluvium, a 5 degree "factor of safety" that is based on the overall trend of the principal faulting will be considered appropriate. Subsurface data (trench coverage or fault location) should not be extrapolated more than 600 feet without additional surface or subsurface information. *En echelon* or other complex faulting may require closer spacing of trenches.

3. The County Geologist shall be notified at least two working days prior to the start of trenching and shall be provided a trench schedule and a site map showing the approximate location of the proposed trenches. In most cases, the County Geologist must inspect the trenches once they are completed, cleaned and logged. Failure to notify the County Geologist may result in the need to re-excavate trenches.

4. A grading permit is currently not required for the excavation and backfilling of fault trenches when conducted under the supervision of a California Professional Geologist. However, exemption from a grading permit does not grant authorization for any work that may be regulated by other agencies. It is the responsibility of the applicant to determine the need for any additional biological, air quality or water quality, studies, permits or monitoring that may be necessary to excavate trenches on a particular site.

5. Appropriate erosion and sediment control measures are expected during and/or following a site investigation when the excavation and backfilling could result in erosion or migration of sediments off site.

6. Trenches excavated in Holocene age alluvium must be a minimum depth of 10 feet. Deeper trenching may be appropriate depending upon the recency of the deposit. In pre-Holocene materials, trenches must be excavated to a reasonable depth to adequately expose faulting.

7. A trench log must be completed on each trench. The log must be a reasonable graphic representation of the subsurface conditions encountered within the trench, show the topographic profile and be at an undistorted scale no smaller than 1 inch equals 5 feet. Trench logs must show distances along the trench, depth and direction and/or identify which trench wall was logged. The strike and dip of faulting, fracturing, bedding and any other prominent features must be clearly shown.

8. The determined or estimated age of faulted and unfaulted materials exposed within the trenches must be discussed within the report.

9. In accordance with Section 82.15.040 of the County Development Code, a minimum 50 foot setback from active faulting is required for non-critical structures. Greater setbacks may be appropriate from poorly defined faulting or complex faulting such as low angle and thrust faulting. Lesser setbacks may be considered from well defined active faulting exposed in pre-Holocene age materials. The Development Code requires a minimum setback of 150 feet for critical facilities such as police and fire stations, schools, hospitals, nursing homes and emergency communication facilities.

10. If there is a potential for active faulting to occur within 50 feet beyond the end of a trench, a 50 foot setback from the end of the trench will be considered appropriate.

11. An active fault is a fault that has produced surface ground rupture during Holocene time (within approximately the last 11,000 years). A potentially active fault is a Quaternary age fault with unknown Holocene activity. For purposes of the Alquist-Priolo Earthquake Fault Zone Act, if it can be demonstrated that surface ground rupture has not occurred along a fault during all of the Holocene, the fault should be designated as "not active". However, determining fault activity is often difficult and may require multiple lines of evidence including soil profiling, geomorphology and age dating techniques. Building setbacks will be required from faults where Holocene activity remains unknown.

12. Principal faulting exposed within the trenches must be accurately located and staked in the field. Fault laths must be surveyed or tied to a recoverable monument. Trench locations must be tied to a recoverable point. Building setback lines must be tied to a surveyed point.

14. Fault location and building setbacks must be shown on a plat within the report and on the Composite Development Plan as well as any other required development or grading plans. The direction, length and setback distance of each segment of the recommended building setbacks must be specified on the plat within the report as well as discussed within the text.

15. Conclusions based solely on geophysical investigation methods are unacceptable. Geophysical methods alone never prove the absence of faulting nor do they determine the recency of activity.

16. Any portion of a site that lies within an Alquist-Priolo Earthquake Fault Zone which was not covered by trenching or other approved means during the fault rupture hazard investigation, must remain restricted. No human occupancy structures or fault sensitive development can occur within that portion of the site unless a subsequent investigation demonstrates it is free of active faulting.

IV.F GEOLOGY AND SOILS

1. Introduction

This section of the EIR describes the current geologic and soil conditions underlying the project site and provides an analysis of potential impacts associated with geological hazards related to seismic impacts and subsurface conditions. This analysis is based on a Feasibility Level Geotechnical Investigation prepared by GeoSoils, Inc., and two Due Diligence Geotechnical Investigations prepared by Petra and LGC Inland. The geotechnical reports are included as Appendix F.

2. Environmental Setting

a) Regulatory Environment

1) State of California Alquist-Priolo Earthquake Fault Zones

The Alquist-Priolo Earthquake Fault Zoning Act of 1972 established the Alquist-Priolo Earthquake Fault Zones in order to mitigate the hazard of surface faulting to structures for human occupancy. The Alquist-Priolo Act (Public Resources Code [PRC] Section 2621) was passed in response to the 1971 San Fernando Earthquake, which caused extensive surface fault ruptures that damaged homes, commercial buildings, and other structures. The primary purpose of the Alquist-Priolo Earthquake Fault Zoning Act is to prevent the construction of buildings for human occupancy on the surface trace of active faults, to provide the citizens with increased safety, and to minimize the loss of life during and immediately following earthquakes by facilitating seismic retrofitting to strengthen buildings against ground shaking (PRC Section 2621.5). Under the Alquist-Priolo Act, the state geologist is required to establish regulatory zones, known as Earthquake Fault Zones, around the surface traces of active faults and to issue appropriate maps to assist cities and counties in planning, zoning, and building regulation functions. Maps are distributed to all affected cities and counties for the controlling of new or renewed construction and are required to sufficiently define potential surface rupture or fault creep. The state geologist is also required to continually review new geologic and seismic data, revise existing zones, and delineate additional earthquake fault zones when warranted by new information. Local agencies are required to enforce the Alquist-Priolo Act in the development permit process, where applicable, and may be more restrictive than State law requirements. In addition, according to the Alquist-Priolo Act, prior to the approval of projects, cities, and counties are required to conduct a geologic investigation of the project site by a licensed geologist, demonstrating that buildings will not be constructed across active faults. If an active fault is found, a structure for human occupancy cannot be placed over the trace of the fault and must be set back. A minimum 50-foot setback is required although setback distances may vary.

The Alquist-Priolo Act and its regulations are presented in California Division of Mines and Geology (CDMG) Special Publication (SP) 42.

In addition, State law allows local jurisdictions to identify active faults and to impose appropriate building restrictions, consistent with the objectives of the Alquist-Priolo Act.

2) State of California Seismic Hazards Mapping Act

The State of California Seismic Hazards Mapping Act of 1990 (PRC Section 2690-2699) addresses the effects of strong ground shaking, liquefaction, landslides, and other ground failures due to seismic events. Under this Act, the state geologist is required to delineate "seismic hazard zones." Cities and counties need to regulate certain development projects within the zones until the geologic and soil conditions of the project site are investigated and appropriate mitigation measures, if any, are incorporated into development plans. Additional regulations and policies, provided by the State Mining and Geology Board, assist municipalities in preparing the Safety Element of their General Plan and encourage land use management policies and regulations to reduce and mitigate those hazards to protect public health and safety. Under PRC Section 2697, cities and counties shall require a geotechnical report defining and delineating any seismic hazard prior to the approval of a project located in a seismic hazard zone. Each city or county shall submit one copy of each geotechnical report, including mitigation measures, to the State Geologist within 30 days of its approval. In addition, under PRC Section 2698, cities and counties are not prohibited from establishing policies and criteria, which are more stringent than those established by the Mines and Geology Board.

State publications supporting the requirements of the Seismic Hazards Mapping Act include the CDMG SP 117, Guidelines for Evaluating and Mitigating Seismic Hazards in California and CDMG SP 118, and Recommended Criteria for Delineating Seismic Hazard Zones in California. SP 117 objectives include the evaluation and mitigation of earthquake-related hazards for projects within designated zones of required investigations and to promote uniform and effective Statewide implementation of the evaluation and mitigation elements of the Seismic Hazards Mapping Act. SP 118 implements the requirements of the Seismic Hazards Mapping Act in the production of Probabilistic Seismic Hazard Maps for the State and establishes criteria for the determination of landslide hazard zones and liquefaction hazard zones. Seismic evaluation and hazard maps have been prepared for the Newport-Inglewood Fault system, Oak Ridge system, Palos Verdes Fault, Raymond Fault, Santa Monica Fault system, Sierra Madre Fault system (San Fernando Fault), and the Los Angeles Blind Thrust Faults, including the Compton, Elysian Park, Northridge, and Puente Hills Faults.

3) The Ontario Plan

The following policies contained in the Safety Element (Seismic and Geologic Hazards Section) within the Policy Plan of The Ontario Plan (TOP) are relevant to the proposed project and geology, soils, and seismic conditions:

- S1-1 Implementation of Regulations and Standards. We require that all new habitable structures be designed in accordance with the most recent California Building Code adopted by the City, including provisions regarding lateral forces and grading.
- S1-2 Entitlement and Permitting Process. We follow state guidelines and the California Building Code to determine when development proposals must conduct geotechnical and geological investigations.
- S1-3 Continual Update of Technical Information. We maintain up-to-date California Geological Survey seismic hazard maps.
- S1-4 Seismically Vulnerable Structures. We conform to state law regarding unreinforced masonry structures.

b) Physical Environment

1) Geologic Setting

On a regional setting, the project site is located within the Perris Block, which is part of a prominent natural geomorphic province known as the Peninsular Ranges. The Peninsular Range is characterized by steep, elongated ranges and valleys that trend in a northwestern direction and consists of plutonic and metamorphic rocks (bedrock) which makes up the majority of the mountain masses, with relatively thin volcanic and sedimentary deposits discontinuously overlying the bedrock, and with Plio/Pleistocene-aged to older Quarternary-aged alluvial fan deposits filling in the valleys and younger alluvium filling in the incised drainages. The alluvial deposits are derived from the waterborne deposition of the products of weathering and erosion of the bedrock.

The localized surficial deposits that underlain the project site consists of Pleistocene and Holocene (recent) alluvial deposits including a surficial layering of undocumented artificial fill including manure that is underlain by young eolian (wind-blown) deposits and by Quaternary-age alluvial fan deposits. No bedrock is exposed in the project site and the bedrock depth within the project vicinity is 400 to 1,500 feet deep. The alluvial fan deposits within the project site are generally flat lying, undeformed, and regionally distinguished from Holocene deposits by the presence of pedogenic soils that regionally have a poorly to well-developed textural B horizon.

The southern portion of the project site is underlain by medium-grained Holocene alluvium. The eastern portion of the project site consists of Delhi Fine Sand (Class III Soil) and sections of the western portion of the project site are underlain with Hilmar Loamy Fine Sand (Class II Soil). Additionally, the project site is located in an area that has the potential for expansive and compressible clay deposits. The project site is relatively flat and has a general one to two percent slope to the southwest.

c) Subsurface Soils

1) Undocumented Artificial Fill

Undocumented artificial fill overlies the entire project site and generally consists of loose to medium dense, fine to medium-grained sand, silty sand, stockpiled manure, and organic matter. The fill extends to variable depths range from approximately one to two feet in thickness. Localized areas of deeper fill may also exist throughout other areas of the project site. Fill located in portions of the project site which contain cattle pens and dairy uses commonly consists of pure manure as thick as 24 inches. Stockpiled manure was also noted in various locations throughout the project site, including several three to six feet high stockpiles within the cattle pens and a five to 15-feet high manure stockpile on the southern portion of the project site, south of the dairy use and adjacent to Eucalyptus Avenue. Organic-rich soils were also encountered in areas beyond the cattle pens where manure have been previously blended with onsite soil to an average depth of six to 12 inches. Due to the potentially loose and highly compressible nature of the soil and organic materials, the surficial materials may be unsuitable for engineering purposes such as foundation support and back fill. However, clean fill materials may be reused for compacted fills once the organic materials have been removed from the site and the site area is approved by the geotechnical engineer prior to placement.

d) Colluvium/Topsoil

Colluvium/Topsoil was observed layering the eolian deposits and Quarternary fan deposits. The colluvium/topsoil is characterized as non-uniform, dry, porous, and loose brown silty sand and was measured to be approximately two feet in thickness. The topsoil has a very-low to low expansion potential, though clayey factions observed have a medium expansion potential. Due to the potentially loose and compressible nature of these soils, they are considered unsuitable for structure support and/or improvements in their existing state. During excavation and development, these soils would be required to be removed and recompacted.

e) Young Eolian Deposits/Quaternary Eolian Sand

The eolian deposits are located throughout the majority of the project site albeit the southwestern portion of the project site. Native eolian deposits, which are wind-deposited, consist of sand and silty sand with subordinate interclass of sandy silt and silt. These materials were generally fine-grained, slightly porous to porous, and loose to medium dense and extended to variable depths of three to seven feet and characterized as grayish brown to yellowish brown. Throughout the project site, the thickness of the deposits was observed between three to seven feet. The combined existing fill and eolian deposits are generally lower in density and more porous as compared to the deeper alluvial fan materials and are considered unsuitable for support of additional fill, residential structures, or other improvements.

f) Medium-Grained Holocene Alluvium

A medium-grained Holocene alluvium is present in the southwestern portion of the project site. These deposits of fine-to-coarse-grained sand are moderately to highly permeable and subject to erosion. The alluvium is relatively porous, compressible, and subject to consolidation under structural loads. Erosion potential of the alluvium is moderate to high.

g) Alluvial Fan Deposits (Quaternary Fan Deposits)

Quaternary-age alluvial fan deposits were encountered underlying the artificial fill, colluvial, and eolian deposits. The alluvial fan materials generally consist of silty sands, sandy silts, sandy clays, and fine-to coarse-grained sands, and are characterized in various shades of gray, orange (oxidized) brown, and red brown. The fan deposits contain Stage II carbonates near the stratigraphic top of the formation. The sediment deposits generally varied from dry to wet, to locally saturated, and generally ranged from medium dense/medium stiff to very dense/very stiff with depth. Below a general depth of approximately five to eight feet, the native alluvial fan materials transition to a stiff condition with only occasional slight porosity. The fan deposits have a very low expansion potential. However, low to medium expansive soils may not be precluded from occurring onsite. Due to potential soil settlement, surface weathered fan deposits should be removed and processed prior to compacted fill placement.

h) Groundwater

The project site is located within the Chino Groundwater Basin, which is part of an extensive groundwater aquifer managed by the Chino Basin Watermaster. According to the year 2000 water level map prepared by the Chino Basin Watermaster, the regional groundwater level is currently at an elevation of about 580 feet above mean sea level, which is approximately 120 feet below ground surface (bgs) at the project site. The south-central Chino Basin area has a relatively shallow water table due to the large drainage area feeding the Santa Ana River, and the natural restriction at Corona and the Santa Ana Canyon. The groundwater resources within the City of Ontario (City) are considered to be good to excellent; however, water quality problems currently exist throughout the Chino Groundwater Basin as groundwater underlying the agricultural preserve has been deteriorating from increased levels of total dissolved solids (TSD) and nitrates due to the manure stockpiles.

Furthermore, the Chino Basin Watermaster recently implemented a Hydraulic Control Monitoring Program (HCMP) that includes installation of desalter well fields within the Basin. One of the main objectives of the HCMP is to maintain groundwater levels at their current elevations. With the implementation and continuation of HCMP, and current demands on groundwater, groundwater levels beneath the project site are expected to maintain near current levels or may continue to drop slowly with the passage of time.

1) Fault Lines and Seismicity

Faulting

No known active or potentially active faults pass through the project site. In addition, the project site is not located within the boundaries of an Alquist-Priolo Earthquake Fault Zone as defined by the State of California in the Alquist-Priolo Earthquake Fault Zoning Act (Geosoils, Inc. 2003). Furthermore, no evidence of lineaments or other geomorphic features that would suggest the presence of active or potentially active faults were discovered on to the project site. However, the Chino-Central Avenue (Elsinore) Fault Zone is located six miles from the project site and is considered active and included within the Alquist-Priolo Earthquake Fault Zone. This fault zone would present a seismic hazard to the project site and is further discussed below.

Seismic Exposure

The project site is located in the seismically active area of southern California and is likely to be subjected to moderate to severe ground shaking. The project site is located six miles from the Chino-Central Avenue (Elsinore) Fault Zone and 12 miles from the Cucamonga Fault. The Chino-Central Avenue Fault is considered active and included within the Alquist-Priolo Earthquake Fault Zone. The Chino-Central Avenue Fault is located approximately six miles southwest of the project site and would generate the most severe site ground motions with an anticipated maximum moment magnitude (Mw) of 6.7 and an anticipated slip rate of 1.0 mm per year. Furthermore, this fault is officially classified by the State of California as an active fault which means that surface rupture has occurred along the fault within the last 11,000 years.

2) Liquefaction Susceptibility

Liquefaction is a phenomenon in which loose, saturated, granular soils temporarily behave similarly to a fluid when subjected to high intensity ground shaking. Liquefaction occurs when three general conditions exist: (1) shallow groundwater, (2) low-density silty or fine sandy soils, and (3) high intensity ground motion. Generally, liquefaction has a relatively low potential at depths greater than 45 feet and is virtually unknown below a depth of 60 feet. No evidence of features commonly caused by seismically induced liquefaction, including mottled soils which indicate a historical absence of high groundwater levels, have been observed on the project site. In addition, as the entire site is underlain at depth by relatively dense Pleistocene-age alluvial fan deposits, no liquefaction potential was observed. No seismically related liquefaction or landslide hazard zones have been delineated by the California Geological Survey in the project area of Corona North Quadrangle. Furthermore, according to the San Bernardino County Hazard Overlays Map for the Corona North Quadrangle, a majority of the project site is not located within a zone of potential liquefaction; and liquefaction and associated dynamic settlement resulting from the effects of strong ground shaking would not occur as the depth of the groundwater at approximately 120 feet bgs and the relatively dense nature of the underlying soil would not result in liquefaction.

3) Subsidence and Collapse

Areal subsidence occurs at the transition between materials of substantially different engineering properties such as basement bedrock and Quaternary fan deposits. Causes of subsidence include tunnels, wells, covered quarries, and caves beneath a surface. On the project site, bedrock underlies the Quaternary fan deposits at a great depth. Thus, the potential for subsidence is considered low. Furthermore, features associated with areal subsidence such as ground fissures, excessive groundwater withdrawal and associated subsidence, or active faulting were observed. As such, the potential for areal subsidence or ground fissures is considered low.

4) Flooding Hazards

According to the San Bernardino County Hazard Overlays Map for the Corona North Quadrangle, the project site is not located within a dam inundation area. However, the western portion of the project site is located within a 500-year flood zone as determined by the Federal Emergency Management Agency (FEMA). As the project site is approximately 700 feet above sea level and approximately 40 miles from the Pacific Ocean, seismically induced flooding from seiches or tsunamis would not occur.

3. Environmental Impacts

a) Methodology

A geotechnical investigation was conducted on site which included field exploration, exploratory soil borings, obtaining representative samples, laboratory testing, engineering analysis, and the review of pertinent geological literature. The laboratory testing determines the characteristics of the geology and soils that underlie the project site. These subsurface conditions were then analyzed to identify potential significant impacts resulting from project construction and operation in relation to geology and soils.

b) Thresholds of Significance

Appendix G of the CEQA Guidelines provides a checklist of questions to assist in determining whether a proposed project would have a significant impact related to various environmental issues including geology and soils. Based on the following issue areas identified in Appendix G of the CEQA Guidelines, a significant impact from geologic conditions would occur if the proposed project would:

Would the project:

- Expose people or structures to potential substantial adverse effects, including the risk of loss, injury or death involving:
  - Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.

  - Strong seismic ground shaking?
  - Seismic-related ground failure, including liquefaction?
  - Landslides?

- Result in substantial soil erosion or the loss of topsoil?
- Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?
- Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?
- Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?

The Initial Study concluded that potential impacts related to seismic-related ground failure, including liquefaction, landslides, and soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater were less than significant. Refer to Appendix A-2 for a discussion of these thresholds.

1) Project Design Features

During project construction, standard cut-and-fill grading techniques would be implemented to establish design grades within the site. The finished grades for the residential portion of the project site would be higher than the recreational portion of the project site. It is estimated that a maximum of proposed cuts and fills would be five feet or less except for areas within the retention basin where thicker fills would be implemented.

Currently, the existing specific plan area generally slopes to the south at approximately 1.0 percent and 2.0 percent. Where slope conditions are present, dwelling units and structures adjacent to the slope areas would be sited to: use the natural ridge as backdrop for structures, use landscape plant materials as a backdrop, and to use structure to maximize concealment of cut slope. In areas where retaining walls are required, exposed walls and fences facing roadways shall be no greater than three feet retaining in height (nine-foot total wall), except as necessary for acoustical purposes to satisfy the intent of the noise ordinance. Where retaining walls or fences face roadways, they shall be built of decorative materials consistent with the wall theme of the neighborhood.

The Conceptual Grading Plan, illustrated in the Grand Park Specific Plan, would be reviewed and approved by the City Building, Planning, and Engineering Departments prior to the issuance of grading permits. In addition, all grading plans and activities would adhere to the City's grading ordinance and dust and erosion control requirements.

2) Consistency with Applicable Regulations

State of California Alquist-Priolo Earthquake Fault Zones

As previously discussed above, the project site is not located within the Alquist-Priolo Earthquake Fault Zone and no known active or potentially active faults pass through the project site. Therefore, the project is not subject to special setbacks or studies established by the Alquist-Priolo Earthquake Fault Zoning Act.

State of California Seismic Hazards Mapping Act

The project would comply with the State of California Seismic Hazards Mapping Act of 1990 as the geologic and soil conditions of the project site have been investigated.

City of Ontario

Policy S1-2 has been implemented as a geotechnical report was prepared for the project site indicating the presence of subsurface soils, potential for liquefaction, groundwater levels, possibility of subsidence, presence of active faults, and the possibility of seismic exposure.

Policies S5-2 and S5-3 of TOP require the project to adhere to Soil Erosion Control Area or City-mandated dust control programs and to provide provisions regarding wind blown sand. The design guidelines of the specific plan would adhere to UBC/CBC requirements and applicable recommendations as presented in the geotechnical studies to mitigate the effects of wind on-site. Furthermore, prior to construction, all grading plans and activities would adhere to the City's grading ordinance and dust and erosion control requirements.

The Specific Plan would provide the necessary geotechnical information to potential developers prior to development within the project area. Furthermore, the project would adhere to all applicable UBC/CBC regulations and to the Soil Erosion Control Area of City-mandated dust control program as required by the City.

The project would adhere to these policies as the Specific Plan would provide all necessary information to developers prior to development with the Specific Plan project area. Furthermore, as stated in this geotechnical section, the determination of possible contamination problems due to the manure stockpiles would be addressed in addition to additional geotechnical evaluations that would be required for further development within the project area.

3) Analysis of Project Impacts

Fault Lines and Seismicity

Faulting

As stated above, the project site would not be exposed to any major faults within the vicinity as the project site is not located within the boundaries of an Alquist-Priolo Earthquake Fault Zone. Also, no evidence of lineaments or other geomorphic features show that the presence of active or potentially active faults exist on or adjacent to the project site. Thus, the project would not be affected by any major earthquake faults and impacts would be less than significant.

Seismic-Related Ground Shaking

As the project site is located in the seismically active area of southern California, the project would likely be subjected to moderate to severe ground shaking, which could result in serious damage to structures; personal injuries, including loss of life; damage to property; and economic and social dislocations. As previously stated, the Chino-Central Avenue Fault is located six miles southwest of the project site and approximately 12 miles from the Cucamonga Fault. The project would result in the construction and occupancy of residential uses, commercial uses, an elementary school, and other public facilities. As such, the project would have the inherent potential to expose persons to ground shaking-related hazards. However, the project would be required to comply with the Uniform Building Code (UBC) standards, which include design requirements to reduce the potential for significant damage to structures resulting from strong seismic ground shaking, and the City standards and procedures. Compliance with the UBC and applicable City standards and procedures would reduce potential impacts related to seismic shaking to less than significant levels.

Liquefaction Susceptibility

As stated above, no seismically related liquefaction or landslide hazard zones have been delineated by the California Geological Survey in the project area of Corona North Quadrangle. Although the majority of the project site is not located within a zone of potential liquefaction, the northeastern portion of the project site has a moderate potential of liquefaction according to the Ontario Sphere of Influence General Plan. However, as stated above, no evidence of liquefaction has been observed on the project site and no seismically related liquefaction or landslide hazard zones have been delineated by the California Geological Survey. According to the Petra study, the review of the San Bernardino County Hazard Overlays Map for the Corona North Quadrangle shows the site is not located in a zone of potential liquefaction. Furthermore, the Petra study concluded that liquefaction and dynamic settlement from seismic events were negligible considering the depth to groundwater and therefore less than significant. For the portion of the project site located in an area outside the liquefaction hazard zone, no liquefaction and associated dynamic settlement would occur as the groundwater levels are approximately 120 feet bgs, and the potential of liquefaction would be less than significant. As such, the possibility of liquefaction to occur in the project site is considered low, thus project-related liquefaction impacts would be less than significant.

Subsidence and Collapse

Subsidence occurs when a void is located or created underneath a surface causing the surface to collapse. Causes of subsidence include tunnels, wells, covered quarries, and caves beneath a surface. As discussed above, the project site does not present features associated with subsidence, therefore the potential for subsidence would be considered low and impacts would be considered less than significant.

As previously discussed, the on-site soils are characterized by high manure and organics content, and therefore may exhibit substantial compressibility and potential for settlement when structures are placed on these materials. Given this condition, structures constructed on-site could be subjected to damage from ground settlement or collapse, which would be considered a potentially significant impact. However, removal of organic content, off-site disposal of these materials, and recompaction of residual soils, included as Mitigation Measure GEO-1, would serve to reduce the risks associated with compressible soils to an acceptable level. With removal of organics and recompaction of on-site soils, impacts would be less than significant.

4) Seismic-Related Flooding Hazards

As stated above, the project site is not located within a dam inundation area, though the western portion of the project site is located within a 500-year flood zone based on FEMA. In addition, the project would not be susceptible to seismically-induced flooding from seiches or tsunamis as the project is located approximately 40 miles from the Pacific Ocean and approximately 700 feet above sea level. Impacts, therefore, would be less than significant and no mitigation measures are required.

4. Cumulative Impacts

Geologic impacts are generally associated with a specific project site or localized area. As such, a cumulative impact analysis of geologic impacts resulting from project build-out would not occur. However, cumulative development in the area would increase the overall potential of exposure to seismic hazards by potentially increasing the number of people within exposed to seismic hazards. In addition, all projects are required to comply with state and local regulations regarding seismic hazards. Therefore, compliance with the applicable building regulations and standard engineering practices would ensure that cumulative impacts would be less than significant.

5. Mitigation Measures

In order to ensure that impact levels related to geology and soils remain less than significant for the entire project site, recommendations provided by the three project geotechnical reports identified in the Introduction Section are included as mitigation measures below.

GEO-1 Future development of urban uses on-site shall implement all applicable recommendations contained in the geotechnical reports related to design, grading, and construction to the satisfaction of the City Building Department, including the following:

- During construction activities, the developer shall be required to perform removal and recompaction of compressible surficial soils for surficial materials with depths of five to eight feet below the existing ground surface in order to mitigate excessive materials settlement. Deeper removals shall be necessary in areas located between boreholes and test pits. Ultimate removal depths shall be determined based on observation and testing by the geotechnical consultant during grading operations.

- Prior to grading activities, the developer shall remove all manure and organic-rich soil and dispose of it off-site. Also, additional testing of organic-rich soils shall be performed following removal of the manure to more accurately determine the actual depth and extent of excessive organic-rich soil that my also require removal from the remainder of the project site. Removals shall be monitored by the geotechnical consultant of record.

- Prior to grading operations, the developer shall export existing manure and organic-rich topsoil, as well as vegetation, off the property. For any remaining soils, exhibiting any organic content greater than one percent shall be thoroughly mixed with other soils during remedial grading.

- During grading activities, contingencies shall be made for balancing earthwork quantities based on actual shrinkage and subsidence.

- Design and construct structures according to Chapter 16 of the 2010 California Building Code.

- Rocks exceeding 12 inches in diameter shall be reduced in size or removed from the project site.

- Reinforced steel in contact with soil shall use Type II Modified Portland Cement in combination with a 3-inch concrete cover.

6. Level of Significance After Mitigation

All impacts related to geology and soils can be reduced to less than significant with implementation of applicable mitigation measures.