

by Yane Nordhav

Are Geologic and Seismic Impacts Significant, Unavoidable or Mitigatable?

The Winter 1998 issue of the AEP Environmental Monitor (Monitor) described a California Appellate Court case, *Shirk, et.al. v. City of Moreno Valley*, in which the seismic impact analysis of an Environmental Impact Report (EIR) was the subject of legal challenge. According to the Monitor summary, the trial court in Riverside County found that the EIR for an 1,800-acre business park development along the Highway 60 corridor adequately addressed seismic impacts by 1) characterizing the hazards on the basis of a technical report, 2) recognizing standard design and construction practices to address expected hazards, and 3) developing a statement of overriding considerations on the basis that proximity to a known seismic hazard represents a significant unavoidable adverse impact.

However, on appeal, the 4th District Appellate Court decided, according to the Monitor summary, that impacts of seismic activity on the people attracted to an area of new development are not environmental impacts. The rationale for this opinion apparently relied on a 1995 1st District Appellate Court decision, *Baird v. County of Contra Costa* (32 Cal.App.4th 1464), which said that the purpose of (CEQA) is not to protect projects from the environment, but to protect the environment from projects. In the *Shirk* case, the Appellate court indicated that seismic impacts should only be addressed if a project had seismic consequences on the physical environment.

Many interesting issues regarding geologic impacts analyses in EIRs are raised by the *Shirk* court case. As authors of dozens of "geology, soils, and seismicity" EIR sections, we have struggled with some of these issues for years. For example:

1. Should the geology, soils, and seismicity sections of EIRs be prepared by non-licensed professionals who summarize technical reports prepared by others?
2. Is it accurate to state that existing physical site hazards are irrelevant to future development proposals, and that only hazards created by a project are

potential impacts?

3. Are Uniform Building Code (UBC) construction design requirements sufficient mitigation measures for seismic hazards, or are seismic hazards unavoidable adverse impacts?

Should EIR Authors be Licensed Professionals?

CEQA does not require that licensed professionals prepare Negative Declarations or EIRs (Section 15149 of the CEQA Guidelines). The information contained in setting sections for typical geology, soils, and seismicity analyses usually relies on published reports by public agencies (e.g., United States Geologic Survey (USGS), Association of Bay Area Governments, City and County General Plans, and California Division of Mines and Geology) and/or preliminary geotechnical reports prepared for an applicant. The information in these publications and reports is generally summarized in the setting sections.

The environmental impact of a project is dependent, in most cases, on the significance criteria established by the lead agency and Appendix G of the CEQA Guidelines; generally, the impact section attempts to answer the questions in the Initial Study Checklist (Appendix I in the Guidelines). Thus, if an active fault traverses a site, an impact section will identify fault rupture as an impact; if landslides are present, landslide hazards will be identified as a significant impact; and if the soils on a site exhibit shrink/swell characteristics, expansive soils will be identified as an impact.

Mitigation measures must be provided for significant impacts, unless the impact is an unavoidable adverse impact. However, most mitigation measures for geology, soils, and seismicity impacts require various degrees of engineering design and professional expertise. Therefore, non-licensed professionals should not be making technical recommendations. The typical seismic mitigation measures found in EIRs are therefore phrased to: 1) follow the recommendations of technical geotechnical investigations to be prepared for site development; 2) follow the

requirements of the Uniform Building Code (UBC); or 3) follow the requirements of the Alquist-Priolo Special Studies Zone Act. In some instances, EIR authors elect to identify seismic hazards as an unavoidable adverse impact, as we discuss below.

Identification of impacts by a non-licensed professional may not adequately identify impacts to a proposed project. For example, an EIR may be prepared for a proposed residential development in hilly terrain, where the applicant has not had a preliminary geotechnical investigation prepared, and slope stability information is available only from regional investigations by a public agency (e.g., USGS). The regional mapping by USGS may not have identified slope stability problems for a relatively small site. To meaningfully evaluate slope stability impacts for the project, the EIR preparer would need to conduct a field visit and assess whether slope stability problems were evident on a site; this cannot legally be undertaken by a non-licensed professional. Providing information on landslide presence on a site may be crucial in evaluating indirect impacts from landslide repairs (e.g., truck hauling of landslide material, visual impacts of substantial grading, adherence to hillside ordinances) as well as impacts from slope instability to proposed structures.

It would appear to be in the best interest of local agencies to require that the geology, soils, and seismicity sections of EIRs be prepared by licensed professionals. Even if a preliminary geotechnical report has been prepared and submitted with an application to the lead agency, the EIR preparers could provide a third-party review of adequacy of the applicant's report.

Impacts to the Environment or Impacts from the Environment?

The next question that must be answered is whether seismically related ground shaking constitutes an environmental impact under CEQA. With the risk of sounding cavalier, in our mind, it is hard to deny that ground shaking impacts to private property and people are an environmental issue that should be addressed under CEQA, regardless what a court might determine.

Let's dispense with this second issue quickly and get on to the more important third and final question, which is much more germane to our profession and needs closer scrutiny.

Geologic hazards may be present on a development site, unrelated to a proposed project. A site may have severe slope stability problems, erosion potential, be near an active fault, or be underlain by materials that liquefy during ground shaking from seismic events. These hazards could affect the people or structures associated with site development; the hazards could also be exacerbated by development. It is often a very fine line to determine which geologic hazards are hazards to the project rather than a result of physical changes to the environment from the project.

The CEQA statutes define "significant effect on the environment" as a "substantial, or potentially substantial, adverse change in the environment" (Public Resources Code Section 21068). However, in the CEQA Guidelines, Appendix G specifically identifies the potential to "Expose people or structures to major geologic hazards" as a significant effect. If we were not to identify existing geologic hazards and their ramifications for site development, then, in most instances, there would be no need for a geology, soils, and seismicity section in a CEQA document.

Developments seldom have the ability to affect seismic activity along active faults or to create areas of significant slope instability (if the area were not prone to such events). However, existing geologic hazards could significantly injure people and/or damage structures on a development site. The new population would not be exposed to such hazards if the specific project were not implemented. Therefore, eliminating the effects of geologic hazards on a proposed project would seem to dismiss or underestimate an important environmental issue to the public and the decision-makers who are considering the merits of a project, which is clearly in conflict with the basic principle of CEQA to require "full disclosure" of environmental impacts.

Are There Mitigation Measures for Seismic Impacts?

Finally, we address the giant of all seismic issues: Can impacts related to ground shaking be mitigated to a level of less than significant, or is it an unavoidable adverse impact that cannot be mitigated to an acceptable level? Preparers of seismic evaluations in EIRs have for years struggled with the issue of whether to identify seismic impacts as unavoidable adverse impacts. The current Initial Study checklist requires that we answer the question of whether a project would result in or expose people to fault rupture, seismic ground shaking, or

seismic ground failure, and Appendix G of the CEQA Guidelines states that exposure of people or structures to major geologic hazards is a significant impact.

The issue of whether a project would expose people to fault rupture impacts is not difficult to assess. The State of California Division of Mines and Geology has identified active faults in the State and has developed set-back zones for construction of structures for human occupancy in the Alquist-Priolo Earthquake Fault Zoning Map. If a project is located within an Alquist-Priolo zone, it is likely that a fault rupture hazard is present. Mitigation of this hazard is mandated by statute and the impact is easily avoidable. However, requiring that structures are not located in areas of fault rupture hazards does not eliminate impacts associated with ground shaking. If a seismic event occurs (and it will), ground shaking will occur. There is not currently any technological methods for eliminating ground shaking associated with seismic events. The question becomes whether ground shaking and resultant structural damage, and possible loss of life, can be mitigated.

The typical mitigation measure for ground shaking impacts is to construct a project in accordance with the Uniform Building Code (UBC). The UBC requires specific design parameters for construction in various seismic environments. The purpose of the required design parameters is to ensure construction of buildings that will resist collapse during an earthquake. Does this mean that people employed or residing in a new development built to UBC requirements would not be subject to ground shaking hazards? Hardly! As we know from recent earthquakes, all areas within a UBC seismic zone do not respond the same during an earthquake. For example, during the 1989 Loma Prieta earthquake the Marina District in San Francisco experienced significant damage compared to other parts of the City. Requiring construction of new buildings to UBC standards does not ensure that there would be no damage to structures or injuries from falling objects during seismic events.

And consider this possibility: maybe residents and workers that take advantage of a new development project have moved from a more seismically active region. Does this mean that the potential seismic hazards associated with the proposed project could actually be considered to be less than the status quo, prior to development of the project site? This argument would be very difficult, if not impossible, to demonstrate.

After grappling with the issue for over a decade, we have come to believe that ground shaking impacts in the most seismically active regions of California do

not appear to be mitigatable to a level of "less than significant." But there are some important ramifications of this position.

If seismic impacts in seismically active areas are considered to be unavoidable and adverse, lead agencies within these areas may be precluded from adopting Negative Declarations under CEQA. In the last decade we have seen a trend of lead agencies preparing more extensive Mitigated Negative Declarations instead of EIRs. However, if a single identified impact of a development project is deemed to be unavoidable and adverse, such as impacts related to regional air quality, traffic, or seismicity, then the agency is required to prepare an EIR and, probably, adopt one or more statements of overriding consideration.

To eliminate this conundrum of determining that local seismic impacts are probably unavoidable and adverse, while also preserving the ability to process projects with a Negative Declaration, a lead agency may include discussion and policies in their General Plan that indicates ground shaking is a risk within their jurisdiction and has been determined to be acceptable by the city or county residents. Then, the agency's CEQA documents, whether EIRs or Negative Declarations, can identify ground shaking impacts as significant and unavoidable, provide the standard UBC mitigation measure, and additionally state that ground shaking is expected in a seismically active region and that people residing in such an area have accepted the (perhaps unmitigatable) risk. In this way, an agency can resolve the critical issue without automatically letting themselves be vulnerable to charges of inconsistency.

Whichever approach is pursued, local agencies should take care to ensure that seismic impacts and mitigation are treated consistently in all the CEQA documents. Because there is still disagreement among private consultants as to how to handle the issue, lead agencies must avoid a situation where one EIR or Negative Declaration treats seismic impacts as significant and mitigatable, while another document determines the impacts to be significant, unavoidable and unmitigatable to a level of less than significant. Ideally, the seismicity issue should be thoroughly documented and resolved in the General Plan, and then all subsequent CEQA documents should refer back to the appropriate plan policies.

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