MITCHELL ENGLANDER
COUNCILMEMBER, 12TH DISTRICT
PRESIDENT PRO TEMPORE, LOS ANGELES CITY COUNCIL

June 2, 2015

Ms. Iris Chi
Los Angeles County Department of Regional Planning
320 West Temple Street Los Angeles, CA 90012

RE: Termo North Aliso Field Project No. R2013614-(5) CUP201200111

Dear Ms. Chi,

In addition to conducting an Environmental Impact Report of the Termo Company drilling proposal in Aliso Canyon, the County's Department of Regional Planning should also conduct a Health Impact Assessment (HIA) to inform the local community about potential health impacts of the proposed project.

The City of Hermosa Beach conducted an HIA as part of its consideration of the E&B oil drilling and production project (please note the attached Executive Summary from Intrinsik on behalf of the City of Hermosa Beach dated September 3, 2014. The full report can be accessed at: http://www.hermosabch.org/modules/showdocument.aspx?documentid=4634). The scope of the City of Hermosa Beach's HIA consisted of the following categories: air quality; water and soil; upset scenarios; noise and light; traffic; and community livability. The review of each of these categories allowed the City of Hermosa Beach to thoroughly assess and determine potential health impacts.

Likewise, a similar study would benefit the review of the Termo Company drilling proposal in order to ensure the health and welfare of the community around the proposed expansion.

Additionally, please find the attached article from Science Daily.com touting the benefits of an HIA in a study from The Colorado School of Public Health at the University of Colorado, Denver. It refers to HIAs as a "...critical public health tool" and the "...Best way to gauge the impact of gas drilling on communities."

I appreciate the opportunity to comment and your consideration of the above.

Sincerely,

MITCHELL ENGLANDER
Los Angeles City Council President Pro Tempore
Member, Twelfth District

cc: Supervisor Michael D. Antonovich
Porter Ranch Neighborhood Council

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SCIENCE INTEGRITY KNOWLEDGE

REISSUED

DRAFT

HEALTH IMPACT ASSESSMENT
E&B OIL DRILLING AND PRODUCTION PROJECT

July 14, 2014

Prepared at the request of:

Department of Community Development
City of Hermosa Beach
1315 Valley Drive
Hermosa Beach, CA 90254

1608 Pacific Avenue, Suite 201 ▪ Venice, CA 90291
Tel: 310-392-6462 ▪ www.intrinsik.com

Notice Regarding Comment Period

This draft Health Impact Assessment has been prepared by Intrinsik Company for the City of Hermosa Beach. It is being circulated to provide residents of Hermosa Beach, and interested parties an opportunity to review the initial conclusions contained herein, and provide feedback for consideration.

Currently, no laws require the use of a Health Impact Assessment (HIA) to evaluate potential public health consequences of proposed projects, changes in land use or policy decisions. However, in an effort to provide the residents of Hermosa Beach with as much information as possible on the health, the City of Hermosa Beach commissioned this HIA. This document was prepared in coordination with the Final Environmental Impact Report (EIR) and draft Cost Benefit Analysis. The HIA supplements the analysis of health effects presented in the Final EIR by incorporating a broad review of public health evidence.

We welcome public review and comments on this document. Public comments received before August 14th, 2014 will be reviewed and incorporated into the final version of this document.

The City of Hermosa Beach does not support nor oppose the proposed project. This report presents a neutral and unbiased perspective on the potential health impacts of the proposed project to the City.

Comments for consideration in the Final Health Impact Assessment can be submitted to:

E-mail: oilproject@hermosabch.org

or via mail/in person to:
Attn: Ken Robertson
Community Development Director
City of Hermosa Beach
1315 Valley Drive
Hermosa Beach, CA 90254
(310) 318-0242

Please provide comments no later than August 14th, 2014.

RATIONALE FOR REISSUED HIA

The first draft Health Impact Assessment (HIA) for this project was released in February, 2014. It was prepared concurrently with the draft Environmental Impact Report (EIR) and Cost Benefit Analysis. The February draft HIA was largely based on the results of potential impacts of pre-mitigation scenarios of the Project.

McDaniel Lambert (now Intrinsik Environmental Sciences (US), Inc. [Intrinsik]) received many stakeholder comments on the February draft HIA. Written comments were submitted by the City of Hermosa Beach, community members and by the Applicant, E&B Natural Resources Management. Oral comments were also received at the presentations on the 24th and 26th of February, as well as at the Saturday Open House on March 8th. A number of the comments affected multiple parts of the document, calling for an extensive revision.

When HIAs are conducted in conjunction with EIRs it is more appropriate to assess the potential for the Project to affect health on the post-mitigation scenarios, since by law certification of the EIR requires the implementation of these measures. This revised draft of the HIA was completed after the release of the final EIR and assesses the Project on the basis of post-mitigation scenarios. Intrinsik also attempted to address stakeholder and public comments provided on the initial draft.

In addition, McDaniel Lambert was able to draw upon the experience of a number of experts from the parent company, Intrinsik. Therefore, this draft HIA was prepared by an expanded multi-disciplinary team. This draft HIA supersedes all previously released material related to the HIA including the February draft report and all corresponding presentations and/or related written material.

Intrinsik Health Impact Assessment Team

Dr. Mary McDaniel, DO, JD, MPH, Mary McDaniel is a board-certified occupational and environmental physician, licensed attorney, and risk and crisis communication expert. She brings more than 20 years of experience in health assessment, risk communication, crisis response, and occupational and environmental medicine.

Dr. Christopher Ollson, PhD, is a Senior Environmental Health Scientist. He has over 17 years of experience in leading human health risk assessments and evaluating health impacts in support of environmental assessments for a range of energy projects.

Bart Koppe, BSc, PBiol, is a Senior Risk Assessment Specialist. His expertise is in conducting health risk assessments for regulatory submissions for oil and gas-related projects. In addition, he is considered an expert in petroleum related air quality issues.

Kathleen Souweine, MPH, is an epidemiologist and has experience in both the environmental sciences and a range of epidemiological projects. She is a former analyst in the USEPA Office of Ground Water and Drinking Water.

Lindsay McCallum, MEnvSci, PhD (Candidate), is an Environmental Health Scientist. In addition to being an experienced health risk assessor she is pursuing doctoral research in health impact assessment at the University of Toronto.

Christine McFarland, BSc, is an Environmental Risk Assessor. She specializes in human health risk and air quality assessments conducted in support of environmental assessments of oil and gas projects.

Katherine Butler, MPH, is an epidemiologist who was formerly with McDaniel Lambert and a co-author of the initial Hermosa Beach draft HIA report. She has since joined the Los Angeles County Department of Public Health, where she is leading efforts to promote HIA capacity building.

External Peer Reviewer

Dr. Elizabeth Hodges Snyder, MPH, PhD is a soil and water scientist and environmental health practitioner originally trained in human and ecological risk assessment. Her interdisciplinary background includes experience in both natural science laboratory and social science research. In the years following attainment of her graduate degrees, her research program and teaching agenda have evolved to address the fields of health impact assessment (HIA) and food security. Recent works include an assessment of participant perspectives on the ability of HIA stakeholder engagement to capture and reflect factors that impact Alaska Native health, and an adapted community food assessment (CFA) in Anchorage, Alaska. Dr. Hodges Snyder is a founder of the Society of Practitioners of Health Impact Assessment (SOPHIA).

PROJECT SUMMARY

INTRODUCTION

Founded in 1907, Hermosa Beach is a small 1.43 square mile city on Los Angeles (LA) County's South Bay coastline, bordered by Manhattan Beach to the north and Redondo Beach to the south. Known as "The Best Little Beach City", it has a population of approximately 20,000 people, with a high proportion of residents between the age of 25 and 50 (US Census, 2013). Under the settlement agreement that ended litigation, an election will be held to allow City of Hermosa Beach (the City) voters to decide whether to repeal the existing ban on oil drilling within the City limits. Repealing the ban on oil drilling would allow E&B Natural Resources Management Corporation's (E&B's) proposed oil drilling and production project to move forward. In order to inform voters about the potential economic, social, environmental, and health impacts (positive and negative) of the E&B proposed oil drilling and production project, the City commissioned a Health Impact Assessment (HIA), in addition to a Cost-Benefit Analysis (CBA) and Environmental Impact Report (EIR). The EIR complies with the California Environmental Quality Act (CEQA), while the CBA and HIA are complementary documents that the City commissioned to provide community members with additional information on the proposed Project.

The proposed E&B Oil Development Project (proposed Project) consists of drilling 30 oil wells on a 1.3-acre site located on the current City Maintenance Yard property (the Site) located at 555 6th Street, at the intersection of Valley Drive and 6th Street in the City. The Site is bounded by industrial/commercial use properties to the north, south, and west. The Site is bounded by the Greenbelt, a park and recreational use space, to the east. Adjacent blocks also include residential uses located 150 feet to the north of the Project Site, 250 feet to the west and 180 feet to the east (east of the Greenbelt). The Pacific Ocean is approximately a half mile west of the Site.

If approved, the proposed Project will be completed in four Phases. Phase 1 will last six to seven months and involves construction activities associated with Site preparation for drilling and testing. Phase 2 will last 10 to 13 months and involves drilling and testing of wells in order to estimate the potential productivity and economic viability of the proposed Project. If Phase 2 determines that the proposed Project is economically feasible, Phase 3 would be carried out to prepare the Site for permanent oil and gas production facilities and to construct offsite pipelines. Phase 3 would take approximately 13 months and involve construction of additional retaining walls and final grading, extending and completing the construction of the cement well cellar, placing a small office building onsite, installation of permanent production equipment, final Site and landscaping improvements, and erecting the 32-foot sound barrier wall for noise attenuation during Phase 4 drilling. The permanent oil production facility will include tanks, vessels, piping, pumps, filters and corresponding metering equipment. Phase 4 is the final phase of the proposed Project and will maximize oil and gas recovery through the construction of an 87-foot high drill rig, the drilling of the remaining oil wells and water disposal/injection wells, and through the continuous operation of the proposed Project. It is estimated that it will take two weeks to set up the drill rig, and two and a half years to drill the remaining wells, up to a total of 30 oil wells and four disposal/injection wells. Facility operations and maintenance would be continuous for approximately 30 to 35 years, with periodic re-drills during the life of the Project.

An initial draft HIA was released in February 2014. Following receipt of a number of public comments and finalization of the EIR, the HIA underwent extensive revision and was reissued in July 2014. The reissued HIA was conducted using a multi-disciplinary approach and was subject to external peer-review by Dr. Elizabeth Hodges Snyder of the University of Alaska Anchorage. Dr. Hodges Snyder provided the HIA team with constructive feedback and a number of comments (Appendix C), all of which have been addressed in the reissued draft HIA.

HEALTH IMPACT ASSESSMENT METHODOLOGY

The World Health Organization (WHO) defines health as *"a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity"* (WHO, 1948). This definition is considered an ideal to strive for, and it forms the basic principle upon which HIA is based.

In California, an HIA is not legally required for this type of project, but an EIR is mandatory. In order to expand on existing health considerations in the EIR, the City of Hermosa Beach commissioned this HIA to help inform voters and evaluate different aspects of the proposed Project through a public health lens. The rationale for the HIA lies in its unique approach to assessing a multitude of potential impacts (both positive and negative) that could affect community health. The HIA is intended to provide additional information, as well as relying on existing information provided in the EIR, to holistically evaluate health. Although the reports are complementary, in several instances the HIA provides further details on how specific aspects of the Project could positively or negatively affect the health of the community, and proposes additional recommendations where necessary. An HIA typically consists of a series of steps that are intended to provide a structural framework around which the assessment will be conducted. Although guidance documents from around the world have slight variations on these steps, they typically include: screening, scoping, assessment, recommendation, reporting, evaluation and monitoring (Ross et al., 2014).

An HIA evaluation matrix is a tool to characterize and summarize the predicted health impacts (positive, negative, and neutral) of the proposed Project so they can be compared and contrasted. As there is no globally accepted standard for health impact characterization in HIA, the evaluation matrix used in this HIA was developed based on best practices published in a number of guidance documents and used in other assessments (Ross et al., 2014; USEPA, 2013; CDPH, 2010; IAIA, 2006; NRC, 2011).

The evaluation matrix developed for this HIA includes consideration of the different characteristics of potential impacts including geographic extent (local, widespread), magnitude, likelihood of occurrence, and others. Each of these characteristics is independently evaluated based on data from the EIR, evidence from the scientific literature, and professional judgment. A brief discussion of the Project without mitigation measures is included where applicable. However, the Project characteristics were ultimately evaluated based on a scenario where the proposed EIR mitigation measures have been implemented. The assessment focuses on the Project including mitigation measures to ensure they are adequately protective and, if not, to propose additional recommendations based on the HIA findings. The evaluation criteria are discussed in further detail below (Table PS-1).

For each health determinant evaluated in the HIA, a technical scientific assessment of the potential health impact includes a detailed discussion of all aspects of the evaluation matrix. A specific definition has been provided for each element (i.e., magnitude, adaptability, likelihood, etc.) to ensure a consistent and meaningful assessment across all determinants.

Table PS-1 HIA Evaluation Matrix

Health Determinant	List the determinant being assessed
Potential Health Outcome	List potential health outcomes associated with each determinant
Pre-Mitigation Discussion	The discussion is limited to identification of the direction of the pre-mitigation impact (positive, negative, neutral or unknown) and identification of any potential issues that could arise if no mitigation measures were implemented.
EIR Mitigation	List mitigation measures from the Environmental Impact Report (EIR), where applicable
Geographic Extent	Localized or Community
Vulnerable Populations	List subgroups that could be disproportionately affected by Project activities
Magnitude	Low, Medium, High, or Unknown
Adaptability	High, Medium, Low, or Unknown
Likelihood	Unlikely, Possible, or Probable
Post-Mitigation Health Effect	Negative, Positive, No substantial Effect, or Unknown
Comments or Additional Recommended Measures	None, or Additional Recommendations (specific and actionable)

Health Determinant: A determinant is defined as "an element that identifies or determines the nature of something." In this case, the determinant is an element of the proposed Project that has the potential to impact health in a positive or negative manner; however, the determinant itself is non-directional. The scoping section of the HIA identifies health determinants that are evaluated in detail.

Potential Health Outcome: List and discuss potential health outcomes associated with the determinant (e.g., the toxicology and physical health changes associated with exposure).

Pre-Mitigation Discussion: A brief discussion of the potential impact of the Project without mitigation is provided for completeness; however, the HIA is based only on a scenario where the mitigation measures required in the EIR have been implemented as part of the Project. The discussion is limited to identification of the direction of the pre-mitigation impact (positive, negative, neutral or unknown) and identification of any potential issues that could arise if no mitigation measures were implemented.

EIR Mitigation: What are the mitigation measures that have been identified in the EIR for this determinant that are related to health and could change the outcome of the HIA? Measures are listed based on information provided in the final EIR.

Geographic Extent: How far are the impacts likely to reach?

- Localized: limited to the areas in close proximity to the Project Site
- Community: potential for wider scale impacts across the community

Vulnerable Populations: Are there populations that could be disproportionately affected (positively or negatively) by Project activities?

Magnitude: What is the extent of the health impact post-mitigation?

- Low: the impact is minor, it is temporary or reversible, and does not pose a hazard/benefit to health
- Medium: the impact is detectable, it is reversible, and poses a minor to moderate hazard/benefit to health
- High: the impact is substantial, it is permanent, and poses a major hazard/benefit to health
- Unknown: the impact is unclear and poses an unknown hazard/benefit to health

Adaptability: How resilient is the community to this type of change; are they able to adapt?

- High: people will be able to adapt to the change with ease and maintain pre-project level of health
- Medium: people will be able to adapt to the change with some difficulty and will maintain pre-project level of health, although some support may be necessary
- Low: people will not be able to adapt or maintain pre-project level of health

Likelihood: What is the probability of the impact occurring based on the expected frequency of the exposure?

- Unlikely: the impact is anticipated to occur rarely, if ever
- Possible: there is potential for the impact to occur on a regular basis
- Probable: the impact will almost certainly occur and persist over time

Post-Mitigation Health Effect: What is the 'direction' of the post-mitigation effect?

- Positive: the effect is expected to positively influence health following implementation of EIR mitigation measures
- Negative: the effect is expected to negatively influence health following implementation of EIR mitigation measures
- No Substantial Effect: there is no substantial effect expected following implementation of EIR mitigation measures
- Unknown: the direction of the effect following implementation of EIR mitigation measures is unknown

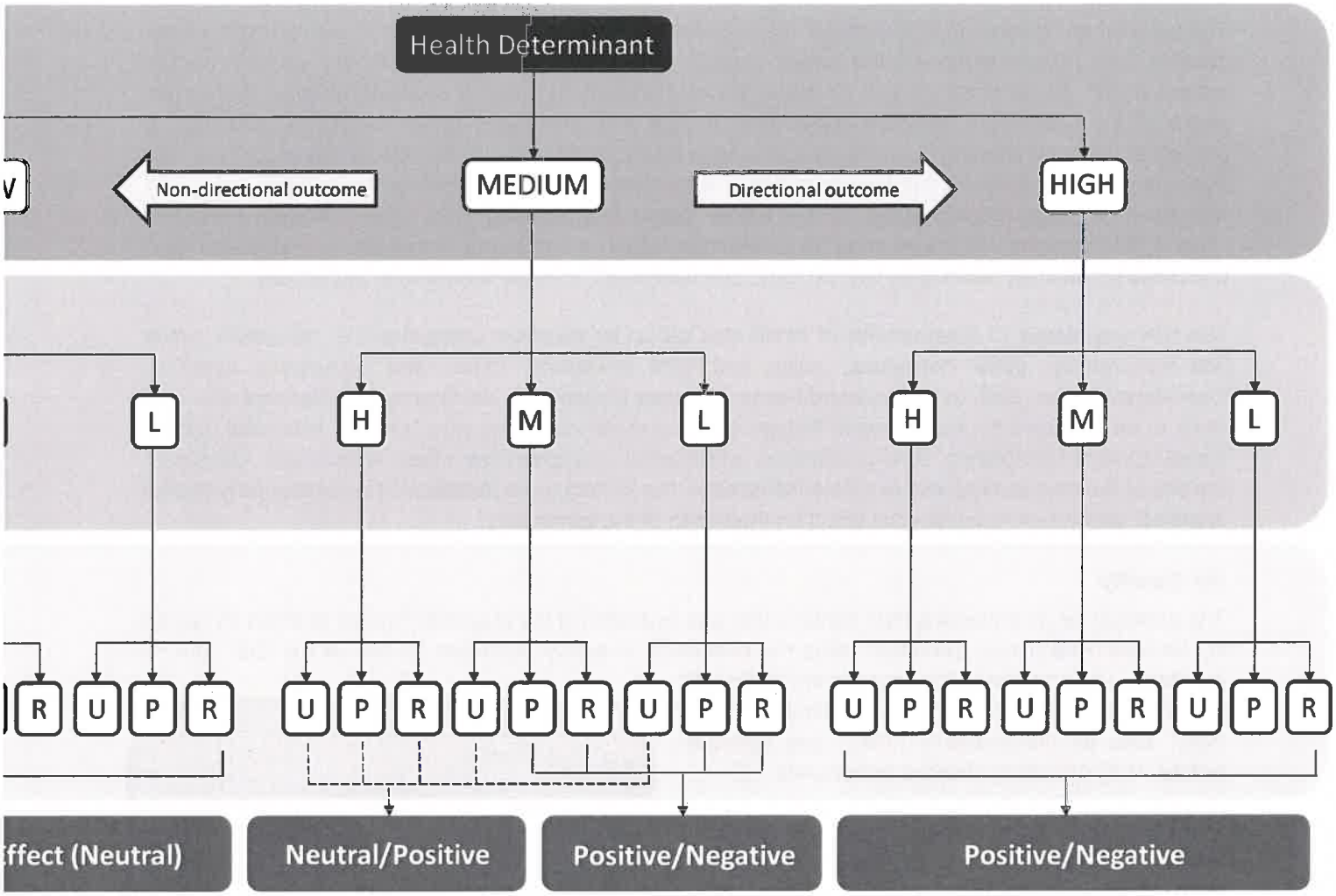
Comments or Additional Recommended Measures: Provide comment about the effect, and/or determine if there any additional measures recommended based on the Post-Mitigation Health Effect.

- None: there are no additional measures recommended based on the findings of the HIA
- Additional Recommended Measures: there are additional measures recommended based on the findings of the HIA (provide brief summary of recommendations)

The decision-making framework (the framework) used to weigh and evaluate each of the elements of the evaluation matrix in order to come to a final conclusion on "Post-Mitigation Health Effect" for each health determinant is provided in Figure PS-1. The elements (i.e., magnitude, adaptability and likelihood) are arranged in descending order (top to bottom) of weight and potential influence on the final determination of effect. Each pathway through the framework leads to a specific conclusion that is either directional (i.e., positive or negative) or non-directional/neutral (i.e., no substantial effect). In some cases where professional judgment dictates, it is possible to deviate from the decision making framework; however, a detailed evidence-based rationale is required to be provided in the accompanying text.

There are three different outcomes that can be used to classify a potential health effect. The classification is based solely on the definitions provided above and is intended to describe the extent of the post-mitigation health impact. The most heavily weighted aspect of the evaluation matrix is magnitude, which comprises the first level of the framework. Adaptability is the next level of the evaluation matrix as it relates to resiliency and ability to maintain health status if an impact were to occur.

This element is less heavily weighted than magnitude but does influence the final determination of effect. The final level of the matrix is likelihood, which is the probability of the impact occurring based on the expected frequency of exposure. Likelihood is less heavily weighted than magnitude but similar to adaptability, it influences the final conclusion, especially in situations where the impact is expected to occur rarely, if ever. Where an element of the evaluation matrix is classified as 'unknown' a discussion of the uncertainty and potential influence of this limitation on the conclusions must be provided. In these scenarios, the determination of effect is largely based on professional judgment and sound rationale.



Making Framework for the HIA Evaluation Matrix (H = high; M = medium; L = low; U = unlikely; P =
)

ASSESSMENT AND RECOMMENDATIONS

The assessment process in HIA involves: (1) developing a health baseline profile, (2) assessing the likely impacts, and (3) characterizing the health impacts. The baseline health assessment establishes the current health status of the City of Hermosa Beach residents in order to evaluate whether the current profile of the community reveals vulnerabilities to any of a number of health outcomes, and also to provide a benchmark so that the HIA can predict the extent of change from current health conditions. The baseline assessment found that Hermosa Beach is a relatively young community that is highly educated, has above average income levels, and a higher sense of well-being than other California residents. Overall, demographic indicators show that Hermosa Beach is not highly vulnerable to negative health outcomes traditionally associated with poverty, unemployment, and low educational attainment.

The HIA considered 17 determinants of health that fall under six major categories (i.e., air quality, water and soil quality, upset conditions, noise and light emissions, traffic, and community livability). Consideration was given to those determinants that were identified as community priorities and are most likely to be impacted by the proposed Project. Each of these outcomes was carefully assessed using a combination of quantitative, semi-quantitative and qualitative approaches where appropriate. Ultimately, the aim of the assessment was to determine whether the Project (post-mitigation) could potentially have a negative, positive or no substantial effect on the health of the community.

Air Quality

The potential for air emissions from construction and operation of the proposed Project to affect air quality in Hermosa Beach was evaluated using the emissions inventory produced as part of the EIR. The air pollutants carried forward for assessment in the HIA included nitrogen dioxide (NO_2), particulate matter (PM), toxic air contaminants (TAC), and hydrogen sulfide (H_2S) and other odorous compounds.

The air quality assessment within the HIA concludes that with implementation of the proposed EIR mitigation measures there is no substantial effect on human health with respect to air emissions (NO_2, PM and TAC). However, periodic odor releases, identified in the EIR as significant and unavoidable, were characterized as negative near the Project Site. Odor can have various health consequences, and could result in periodic discomfort and annoyance near the Project Site.

Nitrogen dioxide (NO_2) has the potential to produce a range of respiratory effects depending on the concentration in air (e.g., eye, nose and throat irritation, inflammation of lung tissue). For the assessment, the maximum 1-hour and maximum annual average NO_2 air concentrations were calculated (background plus Project) and found to be below the WHO air quality health guidelines, indicating that adverse health effects are not expected to result from either short-term or long-term exposure. Additionally, there were no exceedances of California's Ambient Air Quality Standards (AAQS), or the US EPA National Ambient Air Quality Standards (NAAQS) for NO_2. Therefore, it was concluded that exposure to NO_2 from the proposed Project (post-mitigation) is expected to have 'no substantial effect' and no additional recommendations were required.

Particulate matter (PM) is a widespread air pollutant composed of a mixture of solid and liquid particles, and its effects on health are well documented. Particles with a diameter of 10 micrometers or smaller are referred to as PM_{10}, and particles with a diameter of 2.5 micrometers or smaller are known as $PM_{2.5}$. Exposure, particularly to the smaller $PM_{2.5}$ particles, is associated with increased respiratory and cardiovascular disease and mortality. The maximum 1-hour and maximum annual average $PM_{2.5}$ air concentrations were added to baseline concentration in LA County and resulted in exceedances of the

WHO air quality guidelines. However, when background levels from South Coastal Los Angeles County (assumed to better represent Hermosa Beach air quality) were used, the Project was below the California annual AAQS or US EPA NAAQS. The assessment concluded that any exceedances of the WHO air quality guidelines are based on existing background levels in the area and the Project is not expected to have a material impact on existing $PM_{2.5}$ related health risks. While there is no substantial effect from post-mitigation exposure to $PM_{2.5}$ from the proposed Project, existing ambient levels of $PM_{2.5}$ air concentrations in the area are already in the range at which increased mortality has been observed in large urban centers.

Toxic Air Contaminants (TAC) can be used to describe a wide array of chemicals, including volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs), hydrogen sulfide (H_2S), inorganic elements (e.g., metals) and particulate emissions from diesel exhaust. Without mitigation measures, Project emissions of certain TAC would pose a potential risk to human health; however, with implementation of the measures proposed in the EIR, the proposed Project is expected to have no substantial effect and no additional recommendations were required.

Odor can result from the release of compounds such as H_2S. Sensitivity to environmental odors varies greatly from person to person. The most commonly reported symptoms from odor exposure are headaches, nasal congestion, eye, nose, and throat irritation, hoarseness, sore throat, cough, chest tightness, and shortness of breath, among others. According to the WHO, odor annoyance can also affect overall quality of life. Adverse health outcomes associated with odor are related to the frequency, duration, concentration, and the individuals' level of sensitivity. Hydrogen sulfide is the primary odor associated with oil and gas production and is the one with the lowest odor threshold. The H_2S odor threshold (*i.e.,* the lowest concentration perceivable by human smell) is highly variable within the human population and can be detected at concentrations as low as a half of a part per billion (0.5 ppb). Although mitigation measures proposed in the EIR would reduce the frequency of odor releases, they were still identified as 'significant and unavoidable' because of the close proximity of residences and businesses to the Project. For these reasons, the post-mitigation health effect is considered 'negative' near the Project Site and additional recommendations have been provided (i.e., an odor study and/or periodic monitoring in the event of excessive reports of odor).

Water and Soil Quality

If uncontrolled, Site-related chemicals in polluted stormwater runoff water could be detrimental to the environment and human health. For people swimming or recreating in the Pacific Ocean, contact with polluted stormwater runoff could result in acute health symptoms such as eye and skin irritation. Runoff from the proposed Project site generally flows to the west towards an inlet that discharges to the Ocean at an outfall at the end of Herondo Street. During a rain event, contaminants and debris that enter the storm drain system could flow into the nearby Santa Monica Bay, which is currently listed as an "impaired water body" for 'contact' recreation. During Phase 2 and 4 drilling operations, surface runoff at the Project site would be contained with walls and berms and pumped into the water processing system for injection into the oil reservoir; therefore, preventing negative impacts to surface water quality and potential health outcomes during operations. Without mitigation, construction-related contaminants and debris flowing into storm drains connected to the Pacific Ocean could result in impacts to water quality and increases in acute health

The water and soil quality assessment within the HIA concludes that with implementation of the proposed EIR mitigation measures, there is no substantial effect on human health with respect to surface water quality and soil particulates.

outcomes during Phases 1 and 3 of the proposed Project. However, EIR mitigation measures will reduce the possibility of construction-related impacts to the Pacific Ocean through the requirement of a Storm Water Pollution Prevention Plan. Overall, the potential health impact associated with surface water is classified as no substantial effect because Site runoff will be controlled during all Project phases.

Soils under the current maintenance yard and potential Project Site have contamination related to its former use as a landfill. While the Site is currently paved over and thus not posing any present hazard, Project-related construction activities will release particulate emissions when equipment moves on soil or unpaved surfaces and during trenching, grading, and other earth-moving activities. The primary contaminant of concern in onsite soil is lead; however, on-site surface soil data is limited and the top 3 feet of soil is not currently well characterized with respect to potential contamination. Therefore, additional surface soil data is important to address in order to determine the potential health hazard posed by chemicals in soil prior to Phase 3 RAP activities. The EIR required mitigation measure SR-2 addresses this data gap by requiring the Applicant to sample soil during Phase I grading and remove soil contamination exceeding regulatory thresholds from the Site as early as Phase 1 if substantial contamination is present. Implementation of the RAP to remove contaminated soil and mitigation measures to reduce fugitive dust emissions will reduce the possibility of hazardous soil particulate emissions during Project- related activities and thus soil particulates do not pose a substantial effect to human health.

Upset Conditions

This HIA evaluated the health impacts of two upset scenarios, an offsite oil spill and a well blowout. Potential human health impacts of exposure to an offsite oil spill include headaches, eye/skin irritation, respiratory conditions, anxiety, and depression. In the unlikely event of a spill (0.07% chance of an oil spill to the ocean), E&B would be required to contain and clean-up any crude oil in the environment, thus irreversible or chronic health outcomes would not be expected to occur and the HIA concludes 'no substantial effect' related to the oil spill health determinant.

In the oil spill assessment concludes there is no substantial effect with implementation of the proposed EIR mitigation measures. The blowout assessment within the HIA concludes that there is a low probability of occurrence, but in the event such upset conditions were to occur, they could have significant negative health implications. The HIA recommends that the City incorporate the possibility of an oil spill or well blowout into its current emergency preparedness plan.

A well blowout could result in serious injuries and/or fatalities among community members in the vicinity of the proposed Project Site. A well blowout is a very low probability event, predicted to occur once in 323 years during drilling and once in 604,127 years during non-drilling periods if the wells are pressurized. The fear of a blowout accident could result in moderate impacts to human health due to elevated levels of distress over the possibility that a blowout could occur. Because a well blowout could have severe health consequences and the possibility of an upset scenario occurring cannot be completely avoided through mitigation, the blowout assessment concludes a 'negative' health effect. In addition to emergency response plans prepared by E&B, the City should consider incorporating the possibility of an oil spill or well blowout into their current public preparedness awareness program.

Noise and Light Emissions

Noise is ubiquitous in suburban/urban and commercial areas. Health implications associated with exposure to excess noise are typically focused on nighttime sleep disturbance. Since the Project-related activities predicted to produce the highest noise levels were only permitted during daytime hours, nighttime impacts of noise are not a primary concern in the current HIA. The impact of Project-related noise emissions on the local community, particularly residents located around the Project Site and along the pipeline and truck routes is negative without the use of mitigation measures; however, the EIR has identified a variety of mitigation techniques to reduce the potential impact of noise on the surrounding community including a 35-foot acoustical barrier around the Project site. Based on the current HIA, there is expected to be no substantial effect on human health resulting from project activities in Phases 1, 2, 3a (site construction) and 4. There is some potential for negative health effects from high levels of noise associated with pipeline construction (Phase 3b); however, this is expected to be short-term in duration (approx. one week per location) and is limited to daytime hours. Therefore, for Phase 3b (pipeline construction), it is recommended that local residents and local schools be provided with written notification of the impending work that identifies the potential for excess noise and outlines the location and duration (expected to be short-term: 1 week) of the impacts.

The noise assessment within the HIA concludes that, with implementation of the proposed EIR mitigation measures, there is no substantial effect on human health from Phase 1, 2, 3a (site construction) and 4, and a potential negative impact from pipeline construction activities in Phase 3b. Therefore, it is recommended that written notification be provided to residents and schools in the vicinity of these activities that identifies the potential for excess noise and outlines the location and duration of the impacts.

The invention and widespread use of artificial light, especially at night, has become a necessity in many areas of the world to enhance commerce, promote social activity, and increase public safety. Despite the fact that the use of artificial light is a widespread consequence of industrial and economic development, it can have unintended negative consequences, especially when it becomes inefficient, annoying and unnecessary. The major health concern related to excessive light-at-night is disruption of sleep and biological circadian rhythms which influence melatonin production and promote overall health. To ensure visibility, site security and worker safety artificial lighting will be installed as part of the proposed Project. The majority of the on-site lighting will be shielded and downcast to reduce glare. Additionally, the site will have a 32-foot acoustical barrier that will eliminate light spill beyond the Site boundary in most cases. The one exception to this is the presence of lighting on the electric drill rig, which extends up to 87 feet. Residents who have a line-of-sight view of the exposed side of the electric drill rig from their bedroom window(s) may be disproportionately impacted. For these individuals, it is recommended that black-out blinds or curtains be provided to eliminate the potential for infiltration of light emissions from the nighttime lighting on the drill rig.

The light assessment within the HIA concludes that, with implementation of the proposed EIR mitigation measures, there is no substantial effect on human health with respect to light emissions; however, there is potential for nearby individuals to experience disruption of typical sleep patterns. Therefore, it is recommended that black-out blinds/curtains be provided for residents whose bedroom window(s) are in the direct line-of-sight of the exposed portion of the electric drill rig to eliminate any infiltration of outdoor lighting.

Traffic

Increases in traffic volume are associated with increased risk of injury and death due to vehicle-vehicle, vehicle-pedestrian, and vehicle-bicycle collisions. Currently, fatalities resulting from motor vehicle collisions are very rare in the pedestrian and bike-friendly City of Hermosa Beach. A Traffic Impact Analysis (TIA) prepared by Arch Beach Consulting (2013) concluded that project-related traffic would not significantly impact the level of service on any of the studied roadway segments and therefore the EIR indicated that project-related traffic will not have a significant impact on traffic congestion. However, the introduction of truck traffic on roads not accustomed to large trucks could represent a safety hazard to bicyclists and pedestrians. Consequently, the EIR recommends additional mitigation including increased crossing guard presence at the Site, installation of warning signs and lights, ensuring that trucks are not too long, and reconfiguring Valley Dr. Overall, with safety measures in place, and because of the limited extent of increased traffic, traffic safety is not predicted to have a substantial health impact in the community.

The traffic assessment within the HIA concludes that, with implementation of the proposed EIR mitigation measures, there is no substantial effect on human health with respect to traffic safety and perceived traffic safety hazards.

Findings from the literature suggest that perception of safety is an important mediator of the relationship between traffic safety and active transportation, or walking/bicycle trips. Perceived risk of injury may discourage walking and bicycling, which can directly impact health by decreasing physical activity levels. Parental perception of safety is especially important for rates of walking and biking among children. Since the Project Site lies on a safe walk to school route, there is a possibility that perceived traffic hazards could result in decreased active transportation. However, the impact is limited to a portion of Valley Drive. and most community members should be able to adapt to the increased perception of traffic hazards by seeking alternative routes for walking and biking. Therefore, no additional measures are recommended.

Community Livability

Community livability defines elements that make it desirable to live in a particular place. These can include environmental, social and economic elements. For the proposed Project, local residents voiced certain concerns they have regarding different aspects of community livability. The following health determinants associated with community livability were identified and assessed as part of the HIA: property values; access to recreational resources and green space; aesthetics and visual resources; education funding; social cohesion; and, political involvement.

The community livability assessment within the HIA concludes that with implementation of the proposed EIR mitigation measures there is: no substantial effect on human health with respect to social cohesion; a potential negative effect from stress over property values, aesthetic/visual resources; and a potential positive effect on health from enhanced recreation and green space, educational funding and political involvement activities.

Commercial and industrial developments have the potential to impact local property values. The complexities around property value fluctuations make it difficult to accurately evaluate the potential impact from one project. The CBA concluded that property values within Hermosa Beach could be impacted by 0-10%; and it was suggested that any decrease in property values is likely to be localized. Any perceived or actual decrease has the potential to moderately increase stress and anxiety among Hermosa Beach residents, which is suggestive of a negative effect on human health. To reduce any

potential stress or anxiety that local property owners may experience as a result of the proposed Project, E&B could consider having a property value analysis conducted.

Access to recreational areas and green space is an important community resource and can be a key component of overall health and well-being. Hermosa Beach residents are considered to be very active due to their proximity to the beach, access to parks and availability of recreation and fitness facilities. Since the proposed Project would not be removing any existing green space in the community and Project revenue could be used to enhance these resources it is anticipated that it would have a positive impact on community health. It is recommended that a community advisory group be formed to aid the City in deciding priority for recreational / green space funding.

Aesthetic value is a complex concept that is highly subjective. There is a high degree of individual variability when it comes to the visual impact and/or aesthetic value of an object or a place. The presence of the electric and workover drill rigs during Phase 2 and 4 have the potential to negatively impact health by diminishing the aesthetic appeal of the landscape. This has the potential to influence levels of annoyance and stress; however, this is not anticipated to have a substantial effect on health. Therefore, the post-mitigation health effect is considered negative. No additional recommendations have been made.

Educational funding can provide improvements in some of the key indicators of socioeconomic status (i.e., occupation and income) and has been described as a cost-effective method of increasing health and well-being. Hermosa Beach has one of the top school districts in the country and the modest increase in annual funding that will be provided to the schools as a result of revenue from oil production is expected to have a positive effect on health now and in the future.

Social cohesion is a complex concept that is difficult to measure and is related to the interactions between community members. Some local residents have voiced concerns about the situation causing a division in the community – those in favor of oil development versus those opposed. As an indicator of health, social cohesion is linked to the idea of 'quality of life' which is associated with certain aspects of health and well-being. Hermosa Beach residents experience higher levels of well-being than most California cities. Although it is not expected that all residents will experience a reduction in social cohesion due to differences of opinion, some individuals may. For those residents, this could result in increased stress; however, social cohesion is not considered to have a substantial effect on community health.

Active involvement in local politics is associated with increased self-efficacy and can have positive impacts on health and well-being. Hermosa Beach residents have the unique opportunity to decide whether the proposed Project can go ahead by voting on whether to allow oil drilling within the City. This opportunity extends to all adult members of the community, although only a subset of the population is actively involved in the politics and may benefit from the positive impact on health.

MONITORING AND EVALUATION

The following monitoring recommendations have been made for the City to consider including in discussions around the Development Agreement:

- Community Liaison Committee: Consideration should be given to forming a Community Liaison Committee (CLC) if the Project is approved, and prior to commencement of construction activities. The CLC would serve as the vehicle through which citizens could voice active concerns about Project activities. The intention of the committee would then be to work collectively to find ways of addressing resident's concerns.
- Follow-up Community Health Assessment: Analysis of health statistics by susceptible subpopulation status could identify whether some groups are disproportionately impacted by Project operations. An update to the baseline health study could be completed five years after the Project becomes operational, but would depend on the level of concern within the community at that time.
- Quality of Life Health Survey: A quality of life (QOL) health survey could be used as a tool to establish current baseline conditions, and to monitor whether health status changes during the Project. There are well established survey tools available (SF-36 and Pittsburgh Sleep Quality Index [PSQI]) that could be employed. The most cost-effective means of delivering these surveys would be on-line; however, data quality collection can be compromised. Mail drops could also be considered. This survey would then be followed up after operations began.

Although not a component of all HIAs, the evaluation step can demonstrate the effectiveness of HIA in the planning process by showing what the assessment actually achieved. An internal evaluation of the overall approach and effectiveness of the HIA will be conducted internally by Intrinsik's HIA team. The City of Hermosa Beach may also wish to evaluate the utility of the HIA to identify aspects of the process that were beneficial and those that could be enhanced in the future.

CONCLUSION

There is no simple answer to the potential impact that the Project will have on the health of Hermosa Beach residents since different aspects of the proposed Project will impact the community in different ways. We caution that the assessment and conclusions are based on population health and not on single individuals. There are a number of aspects of the Project that may positively influence health (e.g., increased education funding, ability to enhance green space), and at the same time there were potential negative health outcomes identified (e.g., odor, blowouts, property values). With the exception of accidents, the negative health outcomes were largely nuisance related (e.g., odor, aesthetics) without irreversible health impacts. The majority of the health determinants examined revealed that the Project (post-mitigation) would have no substantial effect on the health of the community.

Based on the proposed mitigation measures in the EIR and additional recommendations provided in the HIA, on balance we do not believe that the Project will have a substantial effect on community health in Hermosa Beach.

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Health impact assessments prove critical public health tool: Best way to gauge impact of gas drilling on communities

Date: April 22, 2013

Source: University of Colorado Denver

Summary: As natural gas drilling expands, policymakers, communities and public health experts are turning to health impact assessments to predict the effects of gas drilling on communities, according to a new study.

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FULL STORY

As natural gas development expands nationwide, policymakers, communities and public health experts are increasingly turning to health impact assessments (HIA) as a means of predicting the effects of drilling on local communities, according to a new study from the Colorado School of Public Health.

The report, published this week in the *American Journal of Public Health*, highlights lessons learned when scientists from the school were hired to assess the possible health impacts of fracking in a small western Colorado town.

"Health impact assessments can be a useful public health tool to determine the possible health effects of natural gas development on the local level," said the study's lead author Roxana Zulauf Witter, MD, MPH, at the Colorado School of Public Health. "In fact, our study is now being looked at as a model nationwide."

In 2009, the Colorado School of Public Health was contracted by Garfield County to conduct a health impact assessment of 200 proposed natural gas wells in the community of Battlement Mesa.

The team found that the natural gas project could contribute to health effects such as headaches, upper respiratory illness, nausea and nosebleeds and a possible small increase in lifetime cancer risks as a result of air emissions.

The project would also increase safety risks and mental health effects due to traffic and community changes associated with the industrial activity.

According to the study, the HIA offers a roadmap for other communities and industry to follow in determining the health impacts of gas drilling. It also develops recommendations to reduce those impacts.

"We believe we accomplished the important objective of elevating public health into many levels of natural gas policy discussion," the study said. "The Battlement Mesa HIA provides substantial and valuable guidance for local decision makers to protect public health."

At the same time, the industry can use HIA findings to identify and eliminate health issues before they become problems.

"The whole goal is to provide recommendations to reduce impacts before you start," Witter said. "The assessment is a means to an end. It's a critical public health tool."

Story Source:

The above story is based on materials provided by **University of Colorado Denver**. *Note: Materials may be edited for content and length.*

Journal Reference:

1. Roxana Z. Witter, Lisa McKenzie, Kaylan E. Stinson, Kenneth Scott, Lee S. Newman, John Adgate. **The Use of Health Impact Assessment for a Community Undergoing Natural Gas Development**. *American Journal of Public Health*, 2013; e1 DOI: 10.2105/AJPH.2012.301017

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