File Copy

Michele Napier

Thu, May 31, 2012 2:58 PM

Subject: Written Communication: Please reject the Lehigh FEIR
Date: Thursday, May 31, 2012 2:00 PM
From: Susan Sievert <spsievert@gmail.com>
To: <planning.commission@pln.sccgov.org>
Cc: Marina Rush <marina.rush@pln.sccgov.org>
Conversation: Written Communication: Please reject the Lehigh FEIR

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"BUNDLE 3"

Dear Planning Commission,

At today's public hearing, I would like the county staff to explain two things:

1) Why was the Lehigh Permanente Cement Plant considered an integrated part of the Quarry during the vested rights issue, yet for the RPA FEIR it is excluded from the Project Area? In other words, how can it be both?

2) Please explain why the county appears deceptive in their response to A6-1, page 3.2-105 of FEIR: "However, the former aluminum plant and incendiary materials manufacturing facility site are not within the Project Area."

That is true statement. However, please see the attached "Metals facility site plan from County Assessor." The "Description" list represents Permanente Metals in its entirety – and there can be no question that the following facilities were within the Project Area: Main Laboratory, Foundry, Receiving Room & Dock, Compressor BLDG, Cafeteria, Electric BLDG, Hydrogen BLDG, Nitrogen BLDG, Batter BLDG, Briquette BLDG, Electric storage, and

multiple offices and storage buildings. (source: Exhibit 48, Permanente Quarry Nonconforming Use Analysis)

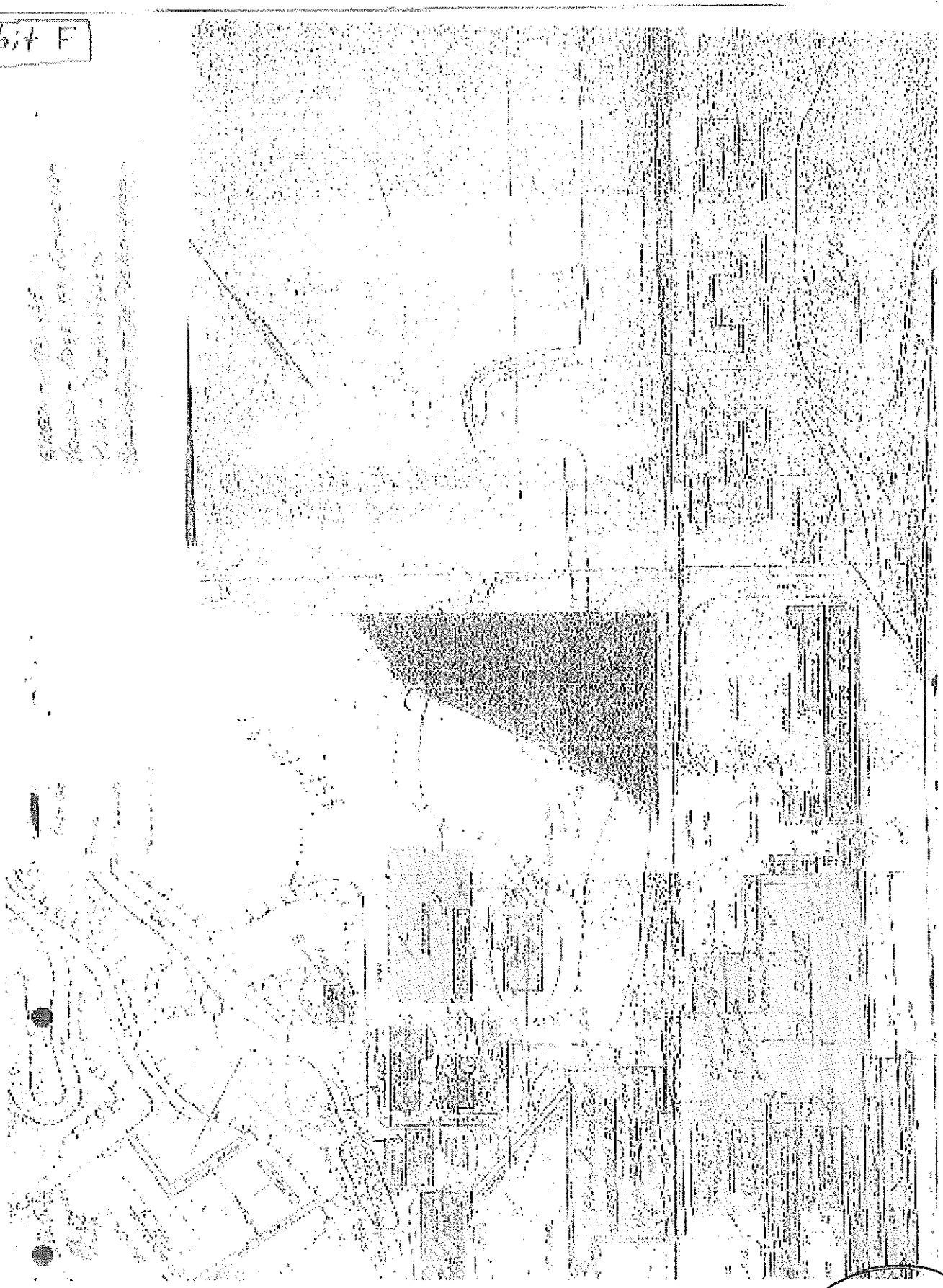
Because of the county's lack of consistency regarding the cement plant; the exclusion of Permanente Metals from the RPA Project Area, and the short window of opportunity to scrutinize the FEIR, I respectfully request the Planning Commission reject the Lehigh RPA FEIR.

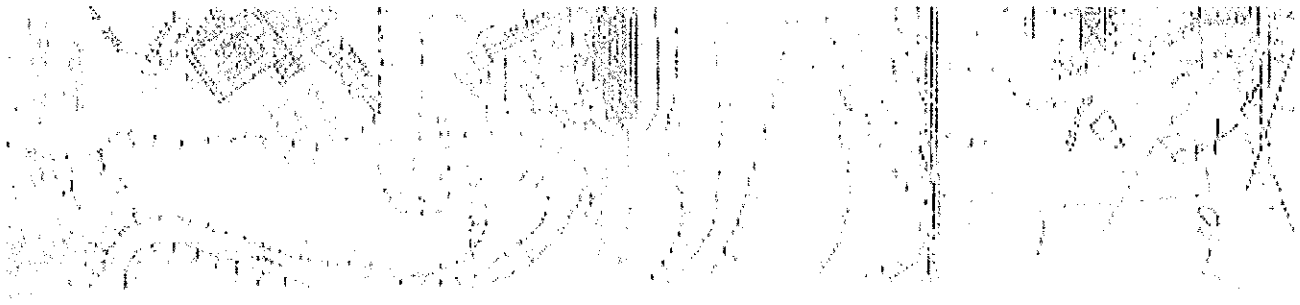
Thank you for your consideration.

Susan Sievert
A resident of Santa Clara County

Cc: Marina Rush, County Planning

Exhibit F





5/5

HARRISON
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& JOHNSON

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May 31, 2012

Scott Lefaver, Chairman and
Members of the Santa Clara County Planning Commission
70 W. Hedding Street, 7th Floor
San Jose, CA 95110

Re: Permanente Quarry Reclamation Plan Amendment
Conditions by Rod Sinks

Dear Chairman Lefaver and Members of the Planning Commission:

This firm represents Hanson Permanente Cement, Inc. and Lehigh Southwest Cement Company (together, "Lehigh"). This letter addresses certain revised conditions of approval that were proposed by Rod Sinks in an email to the Planning Commission members dated May 29, 2012.

The first revision would amend Condition 21 to allow the Regional Water Quality Control Board, or another agency or court, to add more stringent requirements on the Quarry's operations or reclamation. The new language is underlined below:

> 21. Neither the approval of the RPA or compliance with conditions of approval shall relieve the Mine Operator from any responsibility otherwise imposed by law for damage to persons or property, nor shall the issuance of any RPA or related permit serve to impose any liability upon the County of Santa Clara, its officers, employees or agents for injury or damage to persons or property. Moreover, the conditions of approval of the RPA are not intended by the Planning Commission to prevent or interfere with more stringent requirements that have or may be imposed by the RWQCB or any other agency or court.

The proposed language for Condition 21 appears merely to reflect the existing legal and regulatory structure that already governs the Quarry. Subject to that clarification, Lehigh has no objection to this change.

The second revision would replace Condition 77 to introduce several new provisions and concepts. The current version of the condition states:

> 77. Reclamation of the Quarry Pit, EMSA, and WMSA areas shall not be considered complete until 5 years of water quality testing as

described above demonstrate to the satisfaction of the Planning Manager that selenium in surface water runoff and any point source discharges has been reduced below all applicable water quality standards, including Basin Plan Benchmarks.

Mr. Sinks' replacement version would provide as follows:

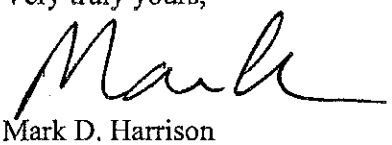
77. After the completion of reclamation, the quality of surface and groundwater discharges to Permanente Creek shall not exceed any applicable water quality standards, including Basin Plan Objectives. Reclamation of all areas shall not be considered complete until 10 years after the ground water levels reach equilibrium, with water quality testing demonstrating to the satisfaction of the Planning Manager than any pollutant including selenium in any groundwater discharge, surface water runoff, and an point source discharges to Permanente Creek have been reduced below, and will not in the future exceed, all applicable water quality standards, including Basin Plan Objectives.

Lehigh objects to these changes. The current version of Condition 77 already requires discharges to meet the applicable water-quality standards for at least five years. This condition was reached based on input from a group of scientists and water-quality experts working both for the County and Lehigh. It preserves the County's need to ensure that reclamation is successful while allowing the Regional Water Quality Control Board the flexibility to apply its own requirements.

Mr. Sinks' version arbitrarily changes the monitoring period to ten years, without any legal or scientific basis, and would expand the water-testing parameters to include an undefined number of pollutants which have never been shown to be a problem at the site. The changes also would require the Planning Manager to somehow make a determination that future water quality would never exceed any applicable standard. It is unclear how the Planning Manager could ever make such a determination. The Planning Commission should allow the existing version of Condition 77 to remain.

We thank the Planning Commission for its consideration.

Very truly yours,



Mark D. Harrison

cc: Orry P. Korb, Esq., Office of County Counsel
Elizabeth G. Pianca, Esq., Office of County Counsel
Kari D. Saragusa, Lehigh Hanson
Marvin E. Howell, Lehigh Hanson

Subject: EMSA
Date: Thursday, May 31, 2012 12:57 PM
From: Mike <mcnuttmike@comcast.net>
To: <Planning.Commission@pln.co.santa-clara.ca.us>
Cc: <Lehigh.Permanente@gmail.com>
Conversation: EMSA

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To Chair of Planning Commission: Scott Lefaver

I am long time resident of Cupertino. I support the completion of construction and reclamation of East Materials Storage Area (EMSA) at the Lehigh Cement Plant.
I believe this plan will obscure views of industrial operation of the plant and improve the view shed for the community.
I hope you will support Lehigh in this endeavor.
Mike McNutt
10368 Westacres Dr.
Cupertino
408-446-9380
mcnuttmike@comcast.net

Subject: Lehigh Reclamation Plan
Date: Thursday, May 31, 2012 12:23 PM
From: Zagar, Heather (Cupertino) NA <Heather.Zagar@hanson.biz>
To: "Planning.Commission@pln.co.santa-clara.ca.us" <Planning.Commission@pln.co.santa-clara.ca.us>
Conversation: Lehigh Reclamation Plan

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To Chairman Lefaver and the Planning Commissioners,

Thank you for taking the time to review my comments regarding the Lehigh Rec Plan that is currently before your Commission for vote. I whole heartedly feel that the Rec Plan should move forward. I'm writing to you today not as an employee of Lehigh, which I am, but as a previous resident of Los Altos.

I grew up in the shadow of the plant, quite literally. Many moons ago, my aunt and uncle lived in the little white house at the edge of the Gate Of Heaven Cemetery. It seemed I was always at that little farm where there were cows, chickens, the occasional sheep for 4-H projects, and my pony. I rode that pony all over the area, around "Big Hill" the fields between Cristo Rey and the cemetery, in the fields surrounding Maryknoll, San Antonio Park and along the railroad tracks to where the Christmas tree farm once was. I spent many a hot summer day goofing around in Permanente Creek. It was a privileged opportunity, one not afforded to many kids in this area, to have such access to open space. Sadly, many of those fields where I once played are now full of expensive houses.

I was one of the speakers that came before you in the first meeting. I am well aware that there exists a small group of men and women who are opposed to our operation, under any circumstances. While I may disagree with their beliefs, I can appreciate their dedication and perseverance.

What struck me the most during that meeting was that we are all talking about the same thing, the environment. The Rec Plan is about restoring land back to the environment, to it's natural state. I suppose Lehigh's supporters and dissidents have agreed to disagree, but of all the things to disagree about, why would the Rec Plan be one? The proposal before you to reclaim the site, vegetate it, and allow it to flourish as a natural habitat is thorough and comprehensive. How can this be considered a negative proposition...I cannot wrap my head around the concept that there is opposition to this proposal.

I do hope that the Rec Plan moves forward and that the reclaimed land remains open space. I think human nature is to think in terms of our current state, and what is best for us now. What is before the Commission now is truly an act that will benefit not only in near term, but preserve and hold Lehigh to an extremely high standard for environmental stewardship for future generations. Unlike so many operations where the operator has simply abandoned sites, leaving tax payers to fund whatever closure or land reclamation is necessary, Lehigh is making the commitment to reclaim a portion of the property of it's own will at no financial cost to the county.

I am doubtful that there will be many places where little girls can ride their ponies in open fields. The land is too valuable to developers and our open spaces seem to vanish before our eyes. I hope that during your review of the Rec Plan, you find that it is the comprehensive and meticulous plan I believe it to be, and approve the plan, thusly securing one small patch of land to remain undisturbed

natural habitat for the County.

Thank you,
Heather Zagar

Heather Zagar
Purchasing Manager

Lehigh Southwest Cement Company
Permanente Plant
24001 Stevens Creek Blvd.
Cupertino, CA 95014

Tel: 408.996.4222
Fax: 408.252-2316
Cell: 408.318.5459
Heather.Zagar@LehighHanson.com
www.heidelbergcement.com <http://www.heidelbergcement.com>

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Subject: Lehigh - Please leave condition 28 intact
Date: Thursday, May 31, 2012 11:51 AM
From: Rhoda Fry <fryhouse@earthlink.net>
To: <planning.commission@pln.sccgov.org>
Cc: <ombudsman@da.sccgov.org>, <Marni.Weber@conservation.ca.gov>, <marina.rush@pln.sccgov.org>, "'Goodwin, Joshua@DOC'" <Joshua.Goodwin@conservation.ca.gov>, <jim.pompy@conservation.ca.gov>
Conversation: Lehigh - Please leave condition 28 intact

Dear Santa Clara County Planning Commission –
On May 24, you received a late change to the conditions for the RPA that would decrease the chances of anything growing well or at all on the re-vegetated slopes. We've already seen "re-vegetation" fail there.

On Item 28, Lehigh has proposed removing "The Mine Operator shall use soil amendments to improve the effectiveness of the soils used for re-vegetation of final slopes"
Please leave requirement for soil amendments intact.
Thank You,
Rhoda Fry

Subject: I Support the Lehigh Reclamation Plan
Date: Thursday, May 31, 2012 11:31 AM
From: Douglas Bushman <douglasbushman@yahoo.com>
Reply-To: Douglas Bushman <douglasbushman@yahoo.com>
To: <Planning.Commission@pln.co.santa-clara.ca.us>
Conversation: I Support the Lehigh Reclamation Plan

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Hello Planning Commission Members,

I support the Lehigh's Permanente site because it does so much for the bay area. (It creates Jobs)

- Lehigh's Permanente continues to provide more than 65% of the cement used in Santa Clara County - and more than 60% of the cement used in the Bay Area.
- The plant helped build the expansion of the **San Jose International Airport; Highways 85, 87, 101 & 280; the Bay Bridge; and Shasta Dam**. They work with regional construction companies within the Bay Area which use their cement and building products.
- They have been an important local employer for decades. Many of their employees have worked for them for decades. In fact, they have a number of families who are second, third and even fourth generation employees.
- The Permanente site is highly regulated by a number of agencies. These include: the Bay Area Air Quality Management District, the U.S. Environmental Protection Agency, the US Mine Safety and Health Administration, the Office of Mine Reclamation, Regional Water Quality Control Board, and many more.

In closing the Lehigh Cement plant is needed to supply cement for the Bart extension, 49ers new home and other projects in the bay area.
Having the source closer lowers the cost of the cement than having to pay high transportation cost to get it here from outside the bay area.
This plant and the other companies employ workers that create jobs that are needed now and in the future in the south bay area.
Vote YES to keep our cost lower in the south bay for the cement used for current building and future projects

Douglas Bushman 38841 Garibaldi Common Fremont, CA.

94536 (408) 316-3870

Subject: Fwd: Lehigh Permanente Reclamation Plan - Santa Clara Planning Commission Pub. Hearng
Date: Thursday, May 31, 2012 10:44 AM
From: Marina Rush <Marina.Rush@pln.sccgov.org>
To: Michele Napier <michele.napier@pln.sccgov.org>
Conversation: Lehigh Permanente Reclamation Plan - Santa Clara Planning Commission Pub. Hearng

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Marina Rush, Planner III

County of Santa Clara Planning Office
70 West Hedding Street, East Wing, 7th Floor
San Jose, CA 95110
email: Marina.Rush@pln.sccgov.org
Phone: (408) 299-5784
Fax: (408) 288-9198

Begin forwarded message:

> **From:** Gary Rudholm <gary.rudholm@pln.sccgov.org>
> **Date:** May 30, 2012 9:25:21 AM PDT
> **To:** Marina Rush <Marina.Rush@pln.sccgov.org>, Rob Eastwood <Rob.Eastwood@pln.sccgov.org>, Elizabeth Pianca <elizabeth.pianca@cco.sccgov.org>
> **Cc:** Nash Gonzalez <nash.gonzalez@pln.sccgov.org>, Nancy Clark <Nancy.Clark@cco.sccgov.org>, "Orry P. Korb" <orry.korb@cco.sccgov.org>
> **Subject: Fwd: Lehigh Permanente Reclamation Plan - Santa Clara Planning Commission Pub. Hearng**
>
> FYI:
>
> In the email chain below is a letter from Libby Lucas that she prepared in response to a questions from the Planning Commission last week. Her letter referenced attached maps and charts but the email did not include any attachments. I have asked her about that and am waiting for a response.

She may send them electronically or may drop them off in the office. When I receive the information I will let you know.

Gary Rudholm
Senior Planner
Planning Office
Santa Clara County
(408) 299-5747
(408) 288-9198 FAX
www.sccplanning.org <http://www.sccplanning.org>

Begin forwarded message:

From: JLucas1099@aol.com
Date: May 29, 2012 10:15:27 PM PDT
To: gary.rudholm@pln.sccgov.org
Cc: JLucas1099@aol.com
Subject: Lehigh Permanente Reclamation Plan - Santa Clara Planning Commission Pub. Hearng

Gary Rudholm, Senior Planner
May 29, 2012

County of Santa Clara Planning Office

County Government Center, East Wing

70 West Hedding Street, San Jose, CA 95110

Dear Gary Rudholm,

At last week's, May 24, Public Hearing on Lehigh Permanente's Reclamation Plan a request was made by a member of the Santa Clara County Planning Commission for documentation on my testimony that I believed there exists extensive connectivity in groundwater underflow from quarry site to the unconfined aquifer zone where prime drinking water wells are located, and that monitoring wells for contaminants are needed in zone.

The geology of this area is complex and there is not one map or study to illustrate groundwater trajectory but rather one must review a composite of water source data. Aside from State Department of Water Resources charts of South Bay's unconfined areas and sub areas, in particular the extent of Santa Clara Valley's prime deep aquifer, there are significant indicators such as CalWater's well cluster at intersection of #85 and #280 and high water depths of 5 to 15 feet downhill from quarry evident in Santa Clara Valley Water District study.

The first school in Santa Clara County was located here and if reliable water source was not Heney Creek then there must have been year-round springs. De Anza's party rested here and viewed the Bay from Signal Hill. The colony of red-legged frogs have historically relied on extensive wetlands here, east of the cemetary and downhill from quarry. This anecdotal background only gives credibility to referenced geological surveys.

There are two reference points to be located to assess the width of the unconfined zone adjacent to eastern terminus of quarry operations which should be discernible on USGS and Department of Water Resources maps. But then there is the more complex concept of the multi layers of aquifers which constitute the deep Santa Clara Valley aquifer, and which are fed by the groundwater cascade that lies along these foothills. As you review this configuration I think you would agree that monitoring wells need to be at upper edge of the unconfined zone adjacent to eastern edge of quarry and eastern materials storage area to accurately assess contaminant loads in groundwater. To test solely at CalWater wellheads would only catch a fraction of flows.

The high percolation in Permanente Creek is separate from this groundwater flow and is illustrated by there being little or no flow below Foothill Expressway, and none by SCVWD's gage, downstream at Berry Ave., for most of year. Have included data to show Permanente is a flashy intermittent creek and believe seleniium loaded pumping from quarry pits is absorbed in unconfined aquifer zone. The Regional Water Quality Control Board's monitoring would accurately show extent of contaminants here but measurements of creek water quality at Charleston Road will only reflect City of Mountain View urban runoff and irrigation of St. Francis H.S. playing fields, not benign residual flows from Lehigh Quarry that may be reaching San Francisco Bay.

In hopes that the attached maps and charts are sufficiently self-explanatory I will elaborate no further. Would like to express reservations on use of 63,000 tons of greenwaste, however, as understand it has more the properties of sawdust so is not likely to hold water from seeping down into quarry limesotne, and due to sterilization process to remove pathogens, it will not contain organic nutrients needed to establish plantings. Test plots need to be implemented before this major element of the reclamation plan is seriously considered.

Thank you for your consideration of this protracted submittal of documentation for Permanente groundwater. I will hand deliver data Wednesday morning to the County Planning Office.

Sincerely,

Libby Lucas,

174 Yerba Santa Ave.,

Los Altos, CA 94022

PS Original sources for this data were Ed Helley, USGS, and Tom Iwamura, SCVWD.

Subject: Re: Written communication: Lehigh RPA
Date: Thursday, May 31, 2012 10:42 AM
From: Marina Rush <marina.rush@pln.sccgov.org>
To: Susan Sievert <spsievert@gmail.com>
Cc: Michele Napier <michele.napier@pln.sccgov.org>
Conversation: Written communication: Lehigh RPA

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Thank you Susan. It will be included in the record, and forwarded to the Planning Commission.

Marina Rush, Planner III

County of Santa Clara Planning Office
70 West Hedding Street, East Wing, 7th Floor
San Jose, CA 95110
email: Marina.Rush@pln.sccgov.org
Phone: (408) 299-5784
Fax: (408) 288-9198

On May 31, 2012, at 10:40 AM, Susan Sievert wrote:

> Hi, Marina.
> On May 29th, I sent this email to the planning commission. I want to make sure it is included in the public record. If possible, I'd appreciate it if you do not include my email address. Thank you.
> Susan Sievert
>
> <begin written communication>
>
> **From: Susan Sievert**
> **Subject:** Written Comment: Lehigh Permanente Quarry RPA

Date: May 29, 2012 11:58:33 AM PDT

To: planning.commission@pln.sccgov.org

Dear County Planning Commission,

Since the Lehigh Permanente Cement Plant and Quarry are an integrated operation, the cement plant must be included in their Reclamation Plan Amendment (RPA).

The Water Board staff found physical evidence of cement plant waste in Lehigh's East Materials Storage Area (EMSA) – an area that is included in the RPA: *"cement kiln bricks --which have been observed in the EMSA and photographed by Water Board staff--and dust used in the industrial processing of mined material; chemical waste materials; waste liquids, solids, and sludges produced in manufacturing industrial products such as aluminum, cement and sand and gravel."* Source: page 6, February 21, 2012 Water Board dEIR RPA comments to the County.

Please do not allow HeidelbergCement, of Heidelberg Germany, "one of the world's largest manufacturers of building materials," with a Market Capitalization of 6.8 Billion dollars to:

1) cry poor so they can skirt US environmental and land use laws, and

2) shift the cement plant's clean-up burden onto the backs of county taxpayers.

Thank you,

Susan Sievert
A resident of Santa Clara County

Free Copy

Michele Napier Thu, May 31, 2012 2:17 PM

Subject: Fwd: WVCAW and BACE comments to Lehigh EIR/RPA
Date: Thursday, May 31, 2012 1:13 PM
From: Marina Rush <marina.rush@pln.sccgov.org>
To: Elizabeth Pianca <Elizabeth.Pianca@cco.sccgov.org>, Michele Napier <michele.napier@pln.sccgov.org>, Gary Rudholm <Gary.Rudholm@pln.sccgov.org>, Rob Eastwood <Rob.Eastwood@pln.sccgov.org>
Conversation: WVCAW and BACE comments to Lehigh EIR/RPA

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45 pages

Marina Rush, Planner III

County of Santa Clara Planning Office
70 West Hedding Street, East Wing, 7th Floor
San Jose, CA 95110
email: Marina.Rush@pln.sccgov.org
Phone: (408) 299-5784
Fax: (408) 288-9198

Begin forwarded message:

> **From:** Tim Brand <timothy.bace@gmail.com>
> **Date:** May 31, 2012 1:08:10 PM PDT
> **To:** marina.rush@pln.sccgov.org
> **Subject: WVCAW and BACE comments to Lehigh EIR/RPA**
>
> Hi Marina,
>
> Please include the attached documents in the record.
>
> Thanks,
> Tim

LOS ALTOS HILLS
CALIFORNIA

5/31/2012
Supplemental Packet
Item # 3

February 17, 2012

Jack Broadbent
Director
Bay Area Air Quality Management District
939 Ellis Street
San Francisco, CA 94109

Re: Proposed Regulation for Portland Cement Manufacturing Facilities

Dear Mr. Broadbent:

It is our understanding that the Bay Area Air Quality Management District (BAAMQD) is considering adoption of Regulation 9, Rule 13 to achieve the maximum feasible, cost effective emissions reductions of Oxides of Nitrogen (NOx), Particulate Matter (PM) and other toxic air contaminants. On behalf of the City Council of the Town of Los Altos Hills, I would like to express our wholehearted support for the District's efforts to regulate cement manufacturing facility emissions. We have strong concerns with regard to cement plant emissions because of the Town's proximity to the Lehigh Cement Company's quarry and cement processing operations in neighboring Cupertino. The scope of the proposed rule appears to ensure that the Lehigh facility will comply with current and future emission limits for toxic air contaminants (TACs) consistent with the National Emission Standard for Hazardous Air Pollutants (NESHAP). The Los Altos Hills City Council completely agrees with BAAMQD's objective in order to protect the health of our citizens.

Many of our citizen complaints and concerns are regarding the detrimental health effects from the emissions from the plant. The Bay Area is in "non-attainment" for ambient levels of ozone and PM. Because NOx contributes to the formation of ozone, and SO2 contributes to increased levels of PM, reducing emissions of these pollutants would help the Bay Area achieve attainment status. This would make the air we breathe healthier for everyone.

It is the opinion of the City Council that maximum feasible, cost effective emission limits can be found in the EPA's new source performance standards for new and modified existing cement plants. Regardless of whether Lehigh meets the legal definition of a modified existing plant, it is in a densely populated area. Thus, this Council strongly

26379 Fremont Road
Los Altos Hills
California 94022
650/941-7222
Fax 650/941-3160

urges the BAAQMD Board to adopt the more stringent new and modified standards for Portland cement manufacturing facilities.

Air pollution drives up health care costs as well as human suffering. By applying the emission limits found in the new source performance standards to Lehigh, we believe these impacts to our citizens would be reduced.

The support and ongoing work of the District and staff in protecting and improving our air quality is greatly appreciated.

Sincerely,

Rich Larsen
Mayor, Los Altos Hills

Re: West Valley Citizens Air Watch (WVCAW) and Bay Area for Clean Environment (BACE) comments for the Lehigh Reclamation Plan Amendment Final EIR and RPA hearing, May 24, 2012 and May31, 2012.

Paragraph 4, page 15, Statement of Overriding Considerations, Attachment A of supplemental package for the Planning Commission may 24, 2012:

1st bullet:
This is circular logic. The County is using the legal requirement for a valid RPA as a reason to approve this particular RPA regardless of its adequacy. They even admit to this on page 15 in listing the following as a benefit, "Therefore, approval of the Project fulfills the state law mandate and Zoning Ordinance Code requirement that a surface mining operation receive approval of a reclamation plan." Clearly the intent of AB 3098 is being inverted since it is resulting in pressuring the County to approve an inadequate plan without adequate review or public participation.

2nd bullet:
SMARA requires that the applicant have an approved reclamation plan and the public can (or should) be able to reasonably assume that they will develop one as required. One way or another Lehigh must have a reclamation plan, and so the benefit of approving this particular plan should be measured in comparison to an alternate plan that would subsequently be approved. Therefore, the mere fact that this plan encompasses a larger fraction of the disturbed area cannot be used as a benefit for overriding consideration. Furthermore, the facts as presented in this paragraph underscore the significant deficiency in County enforcement that allowed the area disturbed by mining to grow from 330 acres to 1238 acres with no penalty. Approval of this RPA will reward this lawless behavior.

3rd bullet:
The "stabilization", "improvement" and "restoration" listed by the County is specious at best. Under this plan, Lehigh will continue to violate the Federal Clean Water act for at least 20 years with uncertain final results as well. We object to continued extraction and blasting deeper into the hillside without implementing adequate mitigation measures. Even if the mine is vested, those vested rights do not include the right to pollute the creek.

In addition, the selenium baseline conditions were never properly established. We have asked questions about the baseline for the selenium which were never answered. How much contamination is due to the depth of the mine and how does the discharge correlate to the pumping activities? How much would be mitigated if they don't continue extracting another 200 feet? The first NOP in June 2007 is used as the baseline condition and this seems arbitrary. The County should use a baseline condition that represents the levels prior to Lehigh's illegal discharges to the creek.

4th bullet:

The County invokes generic claims such as "rehabilitation" and "restoration" under this plan as justification for the "overriding consideration", but these are goals for any reclamation plan and the proposed plan falls far short of ensuring such goals. For example, the scenic easement has been destroyed but no remediation plan has even been proposed. Furthermore, the Factor of Safety (FOS) for slopes hovers on the edge of failure for many slopes even after the proposed reclamation.

5th bullet:
Financial assurance is required by law irrespective of whether the County approves this plan or the next plan and does not qualify as a benefit of approving this particular plan, nor does it qualify as an overriding consideration. Furthermore, the amount posted at this point pales in comparison to the amount that may be required to mitigate the selenium in the event that the proposed plan does not succeed. We are afraid that when this occurs the County will end up paying the bill or worse yet, the condition will remain indefinitely. Plan B seems to be that Permanente Creek will be permanently impaired.

6th bullet:
CEQA requires that a Statement of Overriding Consideration should be "A statement of the **responsible agency's views** on the ultimate balancing of the merits of approving a project despite its environmental damage." (emphasis added) The statement submitted and written by Lehigh in Exhibit 5 is falsely made to appear that it was written from the County's perspective. Why should the public expect Exhibit 5 to meet the "ultimate balancing of competing public objectives" as required by CEQA?

Most importantly, the Exhibit 5 section of the Statement of Overriding Consideration is the only part that discusses the economic benefits and we think that Lehigh's fiduciary responsibility to their shareholders might conflict with Santa Clara County's interests. Exhibit 5 also elaborates on the benefits of cement to the County even though the County has stated repeatedly that the cement plant is precluded from the impacts the public has been allowed to consider. As stated in the final EIR page 3.1-18, section B, "The cement plant is not a component of the project." After the May 24 meeting started, the County released all the arguments for the benefits of the cement plant while neglecting to offer any critical arguments of their own or allow any from the public. The public is entitled to participate in the evaluation of the full economic impacts of the cement operation including the substantial negative effects on health, the environment, etc. For example, note that the health impact from SO2 alone is $35,000,000. (Citizen's Report on the Cement Plant Regulation in the San Francisco Bay Area, Gary Latshaw, Ph.D. May 20, 2012) This cost is a small fraction of the overall health impact from a vast array of other pollutants from the kiln and includes nothing from the thousands of antiquated trucks servicing the plant. The County must include all the impacts from the cement plant and re-circulate the EIR to allow the public an opportunity to participate in the process.

Conditions of approval:

We object to all the changes Lehigh has proposed to the conditions of approval because they weaken the requirements, particularly condition #1 which authorizes the Planning Manager broad authority to change any of the conditions.

We also want to add the following conditions of approval:

1. The cement plant must be included in the project. This is a legal requirement by SMARA which cannot be removed by an administrative action of OMR or the County.
2. The cement plant must be modernized to reduce the pollution. Although the cement plant was previously deemed not part of the project, it has been become a integral and pivotal part of the arguments used by Lehigh and the County for the Overriding Considerations. Therefore, in order to reduce the negative impacts of the cement plant, the County should require that Lehigh submit to the EPA new source performance standards for new and modified existing cement plants. Please also refer to the attached supporting letters from Los Altos Hills City Council and Cupertino City Council.
3. The applicant shall stop all mineral extraction until they demonstrate that selenium discharges do not exceed water quality standards. (It is unacceptable to wait 24 months until any action is considered.)
4. The FACE shall not be reduced or refunded without a public hearing. Note that the County reduced the FACE from $627,255 to $382,040 upon request from Lehigh, (according to SMGB officer's report, July 13, 2006). This report stated that the County "ignored the significant slope stability issues along the mine pit rim, encroachment onto adjacent property, and mitigative efforts to comply with the existing approved reclamation plan"
5. The FACE shall include the cost of a water treatment facility to mitigate the selenium from Permanente Creek.
6. Dumping in the EMSA shall stop immediately.
7. Material from the EMSA shall be used preferentially over WMSA material for fill where needed for reclamation of the main pit.
8. The scenic easement shall be restored.

In conclusion, because of the inability to mitigate the negative effects and the inadequacy of the Statement of Overriding Consideration, the final EIR and RPA should be rejected. The EIR violates CEQA requirements because the county ignored key issues raised by the public and the public did not have the opportunity to review significant aspects of the project. Important materials were introduced at stages late in the process, even up to the hearing date where the cement plant was finally included in the impacts. The RPA violates SMARA because it does not include the cement plant and does not comply with the Federal Clean Water Act.

Sincerely,

Tim Brand, Karen Del Compare, Ken Yew, Joyce Eden and Marilyn McCarthy for WVCAW and Barry Chang for BACE

CUPERTINO

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February 7, 2012

Jack Broadbent, Director
BAAQMD
939 Ellis Street
San Francisco, CA 94109

Dear Director Broadbent,

We understand that the Bay Area Air Quality Management District (BAAQMD) is considering adoption of Regulation 9, Rule 13 to achieve the maximum feasible, cost effective emissions reductions of Oxides of Nitrogen (NOx) and Particulate Matter (PM) in concert with efforts to bring the Lehigh facility into compliance with limits for toxic air contaminants (TACs) consistent with the federal National Emission Standard for Hazardous Air Pollutants (NESHAP).

It is the opinion of this council that the many modifications that have been made to the Lehigh facility may make it appropriate to designate the facility as a remodeled facility so that it may be regulated by an appropriately higher standard.

On behalf of the Cupertino City Council, I wish to express our city's support for BAAQMD to apply the highest possible regulatory standards to the Lehigh cement plant that is immediately adjacent to our community.

The support and ongoing work of the District and its staff is greatly appreciated.

Sincerely,

Mark Santoro
Mayor

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Bay Area Air Quality Management District

939 Ellis Street
San Francisco, CA 94109

Bay Area 2010 Clean Air Plan
Stationary Source Control Measure SSM-9

BAAQMD Regulation 9, Rule 13:

NITROGEN OXIDES, PARTICULATE MATTER, AND TOXIC AIR CONTAMINANTS FROM PORTLAND CEMENT MANUFACTURING

Workshop Report
November 2011

Prepared by:

Robert Cave
Senior Air Quality Specialist
Planning, Rules and Research Division

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1.0 Introduction

The Bay Area Air Quality Management District ("BAAQMD" or "District") will hold a public workshop to discuss and solicit input on proposed Regulation 9, Rule 13: *Nitrogen Oxides, Particulate Matter, and Toxic Air Contaminants from Portland Cement Manufacturing* ("Regulation 9-13" or "the rule"). In Stationary Source Control Measure SSM-9 of the Bay Area 2010 Clean Air Plan, the District identified Portland cement manufacturing as a potential source of emissions reductions of nitrogen oxides (NOx), a precursor of ozone and secondary fine particulate matter. Additionally, the control measure sought to reduce emissions of sulfur dioxide (SO_2), a precursor of fine particulate matter, and particulate matter (PM) from the manufacturing of Portland cement. Reducing emissions would enable the District to make progress toward meeting federal and state ozone and particulate standards, for which the District is currently in a non-attainment status.

In August of 2010, the United States Environmental Protection Agency (EPA) issued final amendments to the National Emission Standards for Hazardous Air Pollutants (NESHAP) from the Portland Cement Manufacturing Industry. The revised NESHAP significantly reduces emissions of toxic air contaminants (TACs) from new and existing Portland cement kilns. Since adoption of the amended rule, individual Portland cement manufacturing companies along with the national industry association have petitioned EPA to reconsider these rules, and subsequently challenged them in Federal Court. In addition, legislation has been proposed in both the U.S. House of Representatives and Senate (H.R. 2681 and S. 1610, Cement Sector Regulatory Relief Act of 2011) to provide a legislative stay of EPA emissions standards that apply to cement manufacturing plants. Either of these efforts may delay or rescind the amended standards of the NESHAP. In order to ensure that emissions from the manufacture of Portland cement are significantly reduced in the Bay Area, the emission limits of the NESHAP are included in the proposed Regulation 9-13.

This report outlines and explains the proposed rule to the public, the affected facility, affected operators, and any other interested persons. This report includes a description of the Portland cement manufacturing process, the air emissions from that process, the regulatory background for emissions standards, and a technical discussion of the means of controlling those emissions. Following the technical review, the draft rule that staff is proposing is described and associated compliance costs are discussed.

District staff will hold a public workshop on December 12, 2011 to discuss the proposed rule. Staff invites participation in the workshop and submittal of written comments on any aspect of the proposal. Staff will then consider all comments, revise the proposed rule as needed, and present the proposed rule to the District's Board of Directors for adoption at a public hearing.

2.0 Background

Portland cement is combined with water, gravel, sand, or other aggregate to form concrete, which is used in road building and a variety of other construction projects. Portland cement manufacture is a $10 billion per year industry in the United States. In 2008, Americans consumed 104 million tons of cement nationally, or 675 pounds per person for the year. Between 85% and 90% of that is produced in the United States with the rest imported primarily from China, Canada, Colombia, Mexico and Korea. There has been a consistent decline in consumption for the past 5 years. Although the Portland Cement Association projected a small increase (3-5 million tons) in cement production in the US for 2010, this increase may be put in perspective by noting that this is still 60 million tons less than the peak consumption levels of 2005.

There are 108 Portland cement manufacturing plants operating in 36 states, with 11 in California, three in Northern California, and one in the Bay Area. Lehigh Southwest Cement Plant (Lehigh), located in unincorporated Santa Clara County, west of Cupertino, is the only cement manufacturing facility in the District. Consistent with national trends, Lehigh has reduced production annually since 2006. Their BAAQMD permit limits their production of clinker (a preliminary stage of cement) to 1.6 million tons per year, but in 2010 Lehigh produced 847 thousand tons of clinker, a little over half the permitted amount.

Portland cement manufacturing is the third largest industrial source of emissions of NOx and SO_2 in the nation at 180 thousand tons per year. Lehigh is the Bay Area's largest source of NOx emissions without modern add-on NOx controls. This facility emitted 1,798 tons of NOx and 181 tons of SO_2 in 2008. The plant has been in operation since 1939, and is subject to a variety of District, State, and federal air quality rules and regulations. District staff initiated rule development on a proposed cement kiln rule and has evaluated more stringent standards for NOx, PM, and SO_2. In addition, U.S. EPA has adopted amendments to federal rules affecting this facility, with compliance due in September of 2013. Staff has evaluated the standards and compliance deadlines of these federal rules to ascertain their application to this facility and to determine what additional technologies and/or methodologies could be employed to reduce emissions of air pollutants in a cost effective manner.

Portland Cement Kiln Overview

Portland cement is a fundamental ingredient of concrete, consisting of calcium, silicon, aluminum, and iron. These materials are combined in a number of steps requiring careful control to ensure that the final product meets specific chemical and physical specifications required for building and construction needs. Figure 1 shows a schematic diagram of Portland cement manufacturing.

Figure 1 – Schematic of Cement Manufacturing Process

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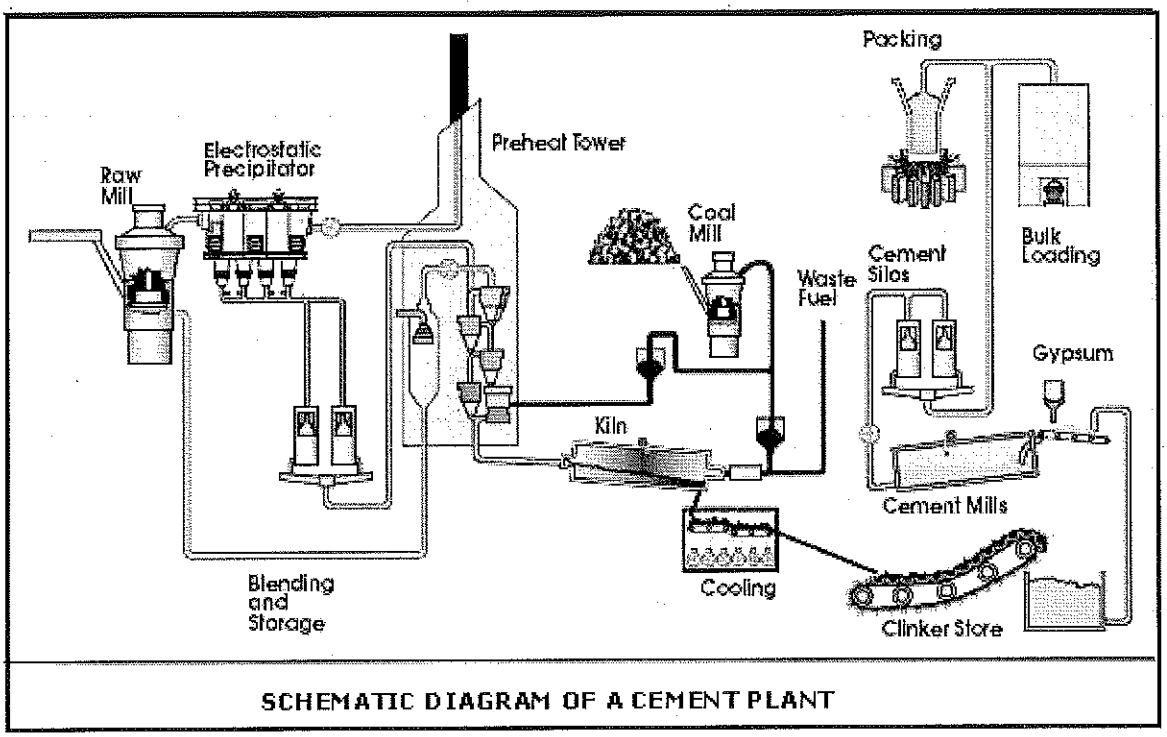

SCHEMATIC DIAGRAM OF A CEMENT PLANT

Manufacturing Steps

Portland cement manufacturing is a series of steps which take place at a large industrial facility usually located adjacent to a source of raw materials. Raw materials consist of limestone, shells or chalk, clay, sand, alumina and iron ore. The bulk of these are mined at a quarry, blended, and ground to a powder. This blended material is subjected to intense heat in a kiln to cause a series of chemical reactions, transforming the powdered raw materials into something called cement clinker. Cement clinker consists of grayish-black pellets the size of marbles or golf balls, which is cooled, ground and mixed with gypsum and other additives to form powdered Portland cement.

In the initial manufacturing step, limestone is mined from a quarry near the plant. At the quarry, the material is reduced to a manageable size (from chair or desk size to softball size) by a two-stage primary crusher before stockpiling and transport to the kiln. The limestone is crushed for a third time and then pre-blended to homogenize the quality of the limestone. It is then mixed with bauxite (a source of alumina) and iron ore before being ground inside a ball mill and further blended to create the required proportions necessary for the desired end product.

In older cement manufacturing plants water is added to the raw materials to form a slurry, and grinding and mixing operations are completed in a slurry form. This aids in conveying the

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material, but the dry method is ultimately more energy efficient. The Lehigh facility converted from wet to dry process in 1981. In order to produce clinker the material must be heated to at least 2400 degrees Fahrenheit and this is much easier when the raw materials are dry. At modern plants, the materials are preheated before entering the kiln and at many facilities the process of making cement is begun at this stage in a process called precalcining. A preheater/precalciner tower is utilized at the Lehigh facility to heat the material to approximately 1650 degrees F, and begin the cement manufacturing process prior to the material entering the rotary kiln.

At the heart of the manufacturing process is the cement kiln. The blended mixture of raw material is fed from the preheater/precalciner into the upper end of a tilted rotating cylindrical kiln where it will reach temperatures of 2400 to 3000 degrees F. This intense heat causes the material to fuse and undergo chemical reactions to create cement clinker. The clinker is discharged from the lower end of the kiln where it is cooled and then ground into a fine powder. Some of this heat is recovered at this stage and routed to the preheater. The ground clinker is mixed with gypsum and ground one final time to make the final product.

Emissions

Emissions to the atmosphere from the manufacture of cement primarily come from combustion of fuel to heat the kiln, with additional point source particulate emissions from the kiln, grinding and mixing operations, and fugitive particulate emissions from transport of materials. Choice of fuel can impact combustion emissions, whether it is natural gas, coal, petroleum coke, or tires. Currently no cement kiln in the US is fired by natural gas due to cost and availability. Lehigh uses 100% petroleum coke, having switched from a mixture of coal and petroleum coke in 2007. Generally, emissions of concern from cement manufacture are the criteria pollutants (NOx, SO_2, PM, and VOCs) and toxic air contaminants (TACs) from combustion. TACs include benzene, hydrochloric acid, dioxins and furans, as well as trace metals such as mercury, cadmium, arsenic, nickel, chromium, and manganese. In addition, cement kilns generate large amounts of greenhouse gases, primarily carbon dioxide (CO_2).

Emissions Inventory

Table 1 shows the average daily emissions from the cement kiln at Lehigh according to BAAQMD records for 2010. These values are determined by emission factors assigned by District permit engineers, stack testing, mass balance estimates, and the annual throughput of fuel used and clinker produced as reported by the facility. Lehigh reported that they produced 847 thousand tons of clinker in 2010, a little over half the permitted amount of 1.6 million tons per year.

Table 1 – Lehigh Southwest Cement Company Kiln Emissions (2010)		
Pollutant	**Average emissions in pounds**	**Average emissions in**

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	per day	pounds per ton of clinker
Particulate Matter (PM)	32.62	1.40E-02
Precursor Organics (POC)	59.2	2.55E-02
Oxides of Nitrogen (NOx)	9,290	4.00E+00
Sulfur Dioxide (SO_2)	2,665	1.15E+00
Carbon Monoxide (CO)	5,435	2.34E+00
Benzene	16.1	6.84E-03
Hydrochloric Acid (HCL)	179	7.63E-02
Mercury	0.72	3.05E-04
Total Equivalent CO_2	4.08E+06	1.76E+03*

**NOTE: Total equivalent CO2 value calculated based on 2008 inventory scaled by the ratio of reported clinker produced for 2010 and 2008.*

Federal Regulations

Two federal rules address air emissions from the manufacture of Portland cement: New Source Performance Standards (NSPS) and National Emission Standard for Hazardous Air Pollutants (NESHAP). EPA generally promulgates NSPS for specific industrial operations to address emissions of criteria pollutants from new, modified, and reconstructed sources. NESHAP addresses emissions of TACs (also known as hazardous air pollutants) from both new and existing sources, and may have separate standards for each case.

The NSPS for Portland cement manufacture was originally promulgated in 1971, and has been amended many times. Clean Air Act amendments of 1977 require a quadrennial review of all NSPS and, if deemed appropriate, EPA revises the standard. The most recent amendments to the NSPS were proposed in June of 2008 and finalized in August of 2010. The previous standard remains in effect for all sources constructed after 1971. For facilities constructed, modified or reconstructed after June 6, 2008, emissions standards have been made more stringent, and the monitoring methodology has been modified. EPA is requiring continuous emission monitoring systems (CEMS) for each of the three pollutants covered under this rule (PM, NOx, and SO_2).

EPA initially issued the NESHAP for Portland cement manufacture in 1999 to limit emissions of PM as a surrogate for certain toxic metals contained in cement kiln and clinker cooler PM, to limit dioxin/furan emissions, and to set a hydrocarbon limit for new kilns. Several organizations filed petitions for judicial review of that rule. In 2000, the US Court of Appeals remanded parts of the 1999 standard and instructed EPA to consider standards for hydrochloric acid (HCL), mercury, total hydrocarbons, and metallic hazardous air pollutants. In December of 2006, EPA issued final amendments to the NESHAP to set limits for mercury and total hydrocarbons for kilns built after December 2, 2005 and to require that existing kilns meet "work practice" standards to reduce emissions of mercury and hydrocarbons. In a separate December 2006 action, EPA announced that it would reconsider the emission limits for mercury and total hydrocarbons for new cement kilns. Prior to that action, EPA had been sued by the cement industry, environmental groups, and state environmental agencies on the final amendments, and

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also received petitions to reconsider the existing source standards for mercury, hydrocarbons, and the decision not to regulate HCl. On April 21, 2009 EPA proposed to amend the NESHAP to reduce emissions of mercury, total hydrocarbons, HCl, and PM from both new and existing cement kilns.

On August 6, 2010, EPA issued final amendments to both rules. The revised NESHAP significantly reduces emissions from new and existing Portland cement kilns, and the NSPS further limits emissions from new and modified operations. Table 2 illustrates the standards in the federal NSPS for NOx, SO_2, and PM; and Table 3 shows the NESHAP limits.

Table 2 – 2010 New Source Performance Standards	
Pollutant	Emission Limit
Oxides of Nitrogen (NOx)	1.5 lb/ton of clinker, averaged over 30 days
Sulfur Dioxide (SO_2)	0.4 lb/ton of clinker, averaged over 30 days
Particulate Matter (PM)	0.01 lb/ton of clinker, averaged over 30 days

Table 3 – 2010 National Emission Standards for Hazardous Air Pollutants		
Pollutant	Existing Facilities	New and Modified Facilities
Mercury	55 lbs/million tons of clinker, averaged over 30 days	21 lbs/million tons of clinker, averaged over 30 days
Dioxins/Furans*	0.2 nanograms/dry standard cubic meter (ng/dscm)(TEQ), averaged over 24 hours	0.2 ng/dscm (TEQ)*, averaged over 24 hours
Total Hydrocarbons	24 parts per million by volume (ppmv), averaged over 30 days	24 ppmv, averaged over 30 days
Total Organic HAP*	9 parts per million by volume (ppmv), averaged over 30 days	9 ppmv, averaged over 30 days
Particulate Matter (PM)	0.04 lb/ton of clinker, averaged over 30 days	0.01 lb/ton of clinker, averaged over 30 days
Hydrochloric Acid (HCL)	3 ppmv, averaged over 30 days	3 ppmv, averaged over 30 days

**NOTES: The Total Organic HAP standard is an alternative to the Total Hydrocarbon Standard. The Dioxin/Furan standard is unchanged from the previous NESHAP standard. Toxic Equivalent (TEQ) weighs the toxicity of less toxic compounds as fractions of the most toxic compound of the group.*

The amended NESHAP will reduce emission of mercury, total hydrocarbons, HCl, and PM from both new and existing kilns. The amended NSPS will reduce emissions of NOx, SO_2, and PM from "new" kilns (those constructed, modified, or reconstructed after June 6, 2008). Facilities are given three years to meet these limits as the deadline for full implementation of these rules is September 9, 2013. EPA estimates that by that date the NESHAP will result in national

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emissions reductions of 92% for mercury, 83% for total hydrocarbons, and 97% for HCl. EPA estimates that implementation of the NSPS will result in national emissions reductions of 78% for SO_2, 5% for NOx, and 92% for PM, although PM is addressed in both the NESHAP and the NSPS. The federal regulations would reduce emissions at the Lehigh facility by approximately the following amounts: 93% for mercury; 91% for total hydrocarbons; and 70% for HCl. The Lehigh facility is not "new or modified" and so only the amended NESHAP limits would apply and not the amended NSPS limits. As previously stated, legislation pending in the US House of Representatives and Senate could stay or rescind these federal regulations.

California Regulations

All cement kilns operating in California are subject to permitting by the local air district. Major sources of air pollution like the Lehigh facility are required to obtain Title V operating permits which incorporate the applicable NESHAP, NSPS and District regulations. There are currently no State rules that specifically regulate cement manufacture, other than greenhouse gas emissions reporting requirements and those rules governing the use of scrap tires as fuel. Several air districts (Antelope Valley, Amador, Kern, Mojave, and Monterey Bay Unified) with cement kilns operating within their jurisdiction have adopted regulations to address emissions of NOx and/or PM from these sources. South Coast Air Quality Management District has adopted several cement manufacturing regulations addressing emissions of NOx, PM, CO, as well as hexavalent chromium and fugitive dust. At least two of these regulations were adopted to address specific conditions at individual cement manufacturing facilities.

Applicable BAAQMD Regulations

While there is currently no BAAQMD rule which specifically addresses cement manufacturing operations, these operations are subject to a number of District regulations that govern permitting (e.g., Regulation 2-1, 2-2), emissions of toxic or hazardous compounds (Reg. 2-5), and some general or miscellaneous regulations for individual pollutants (Reg. 6-1 for PM, Reg. 8-2 for VOCs, Reg. 9-1 for SO_2, and Reg. 11-1 for lead). Requirements for these rules are incorporated into the Title V permit for Lehigh along with the applicable federal requirements of the NESHAP and NSPS.

3.0 Technical Review

Controlling Emissions from Cement Manufacturing

The manufacturing of cement requires the movement and processing of many tons of material as well as the combustion of large amounts of fuel in order to heat that material to extremely high temperatures. Emissions of pollutants are directly attributable to both the fuel combustion and materials processing. Any improvements to the efficiency of the material handling processes as well as the delivery of heat can result in a reduction in emissions to the atmosphere. Over many years of operation Lehigh has implemented efficiency related modifications to their process as the state-of-the-art of cement manufacturing has developed. The facility has switched from a wet to a dry process, introduced heat recovery methods, and installed a precalcining tower. The driving force behind these modifications has been financial, but the improved efficiency has also reduced emissions. Staff is continuing to evaluate potential efficiency improvements, but there do not appear to be any obvious additional modifications of this type that might be undertaken at this time. Add-on emissions control or improvements to existing emissions control devices hold far greater potential to reduce emissions in a cost effective manner.

NOx Emissions Control

The formation of NOx during the manufacture of cement is due to the high temperature, oxidizing atmosphere necessary for clinker formation. NOx is primarily formed by two mechanisms: the oxidation of molecular nitrogen in the combustion air or "thermal NOx"; and the oxidation of nitrogen compounds in the fuel or "fuel NOx". Although the contribution of fuel NOx cannot be discounted, in the high temperature zone of cement kilns, thermal NOx is the dominant contributor to NOx formation. Additionally, some NOx may be formed by oxidation of nitrogen compounds from the raw materials or "feed NOx", and a small amount of NOx is formed instantaneously at the flame surface or "prompt NOx." The predominant nitrogen species in cement kiln exhaust gas is NO, at typically up to 90-95%, with NO_2 accounting for the remainder.

Emissions of NOx from cement manufacture come primarily from the manner in which fuel is combusted to heat and chemically formulate the cement clinker. As such, these emissions may be reduced by control of the combustion zone temperature and excess air, as well as combustion modifications. These modifications include low NOx burners in both the kiln and precalciner, mixing air systems, fuel addition systems, and staged combustion. In addition, post-combustion controls involving the use of chemical additives to the pollutant stream can further reduce emissions of NOx to the atmosphere. Many of these methods may be used in combination and some preclude one another or have operational constraints due to the design of the kiln that may limit their efficacy.

A number of post-combustion or add-on control techniques have proven successful at removing NOx in exhaust streams from a variety of industrial combustion sources. These include scrubbing technology utilizing various chemical additives, oxidation technology utilizing

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hydrogen peroxide, and selective reduction technology utilizing ammonia or urea injection either with or without a catalyst present. The applicability of these add-on NOx controls to the exhaust from cement kilns is somewhat limited by high temperature, high flow rate, and high level of particulate in the exhaust. The cost, availability, and handling requirements of the chemical additives can further restrict their usefulness in this application. The two post-combustion techniques that present the greatest likelihood of successful NOx reduction from cement kiln exhaust are selective non-catalytic reduction (SNCR) and selective catalytic reduction (SCR).

Both SNCR and SCR utilize a nitrogen based reducing agent (usually ammonia or urea) to convert NOx into molecular nitrogen (N_2) and water vapor (H_2O). The chemical reactions that accomplish this conversion depend on the reducing agent and the presence of a catalyst. However, the catalyst and the temperature at which the reactions occur is the main difference between SNCR (1600-2000°F) and SCR (570-700°F). Ammonia may be obtained as either anhydrous (dry) or aqueous (mixed with water). Anhydrous ammonia is the most efficient form because it is 100% ammonia, but there are significant issues with the transport, handling and storage of anhydrous ammonia. Both EPA and OSHA classify anhydrous ammonia as a hazardous material. Aqueous ammonia is not a hazardous material but is usually available in concentrations of 19% or 29% by weight, so a greater amount is required to achieve the same benefit. Urea is perhaps a safer alternative than anhydrous ammonia, but is about 46% nitrogen, so it takes about twice as much mass of urea to provide the same NOx control. Urea is available in dry form or mixed with water at 40% to 50% by weight urea solution. Urea solutions are also more viscous than aqueous ammonia so delivery systems must account for this.

Use of either SNCR or SCR would require substantial equipment upgrades as well as operational modifications to any cement manufacturing plant. Operational plans and equipment are required for the delivery, storage, mixing and delivery of the reagent. The complexity of this depends on the form of the reagent used. The performance of these systems is highly dependent on temperature, residence time, and concentration of the applied reagent. Control systems to monitor these variables as well as CEMS for NOx and ammonia are required to determine the optimum conditions to maximize NOx control and minimize emissions of unreacted ammonia. Emissions to the atmosphere of unreacted ammonia resulting from the use of SNCR and SCR are referred to as "ammonia slip" and can result in odor concerns, stack plume visibility problems and secondary PM formation. Additional issues associated with poorly managed SNCR systems at cement plants include the potential for increased emissions of CO, and N_2O (more likely when using urea as a reagent).

SNCR has proven an effective means of NOx control at a number of cement kilns across Europe, Japan, and the United States. The first trial use of this technology in cement manufacturing occurred in Europe in 1979, with further trials carried out at cement plants in Europe and Japan throughout the 1980s. As of 2007, over 60 cement plants across Europe utilized SNCR for the control of NOx emissions achieving control efficiencies in excess of 50%. Higher NOx reduction efficiencies are possible when SNCR is paired with staged combustion or some other combustion modification. In the United States, the application of SNCR to cement kilns is more recent and initially only proved successful on preheater/precalciner kilns. However, there are currently several cement plants across the country utilizing SNCR including wet kilns, long kilns

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and those using waste derived fuels. Reported NOx control efficiencies for the US applications run from 12% to 65%. Higher efficiencies are generally associated with higher concentrations of ammonia added to the flue gas, and this often results in greater ammonia slip (emissions of unreacted ammonia).

SCR has proven an effective means of NOx control for a variety of combustion sources, from gas turbines at power plants to industrial boilers to diesel locomotives and even automobiles. The application of this technology to cement kilns is much more limited. Primarily, this is due to the high levels of dust in cement kiln gas at the temperature favorable for SCR use. It is possible to utilize SCR after the PM control device, but the exhaust gases would need to be reheated. SCR requires a catalyst bed, catalyst cleaning system, bypass ducting and periodic replacement of the catalyst, and a significantly higher capital investment over SNCR. There are three known cement plant SCR installations worldwide, all in Europe, and another is due to be installed in the US in Illinois in 2013. The first SCR system on a cement plant began operation in 2001 at the Solnhofer cement plant in Germany. In 2006 and 2007 two cement plants in Italy began operation of SCR systems. All of these are high dust applications. It is worth noting that the Solnhofer plant in Germany employs both SCR and SNCR technology, to avoid downtime during cleaning of the catalyst bed. The NOx emission limit applied to that plant under permit is such that it can be met by the less efficient SNCR technology. The system to be installed in Illinois is by consent decree as part of a Clean Air Act Settlement between EPA and Lafarge North America.

In determining emissions levels for the NSPS, EPA considered lower NOx levels based on performance of SCR, but determined that SCR was not "sufficiently demonstrated technology for this industry." This determination was made with full knowledge of the three facilities in Europe, the successful demonstrations of SCR for control of other source categories, and the proposed installation in Illinois as part of a settlement agreement. EPA is concerned about the potential for dust buildup on the catalyst, which can be influenced by the site specific raw material characteristics of the facility's quarry. Dust buildup on the catalyst can reduce the effectiveness of the SCR and cleaning the catalyst can result in significant downtime. EPA has based its NSPS NOx emission limit of 1.5 lbs. per ton of clinker on a well-designed preheater/precalciner kiln (i.e. with staged combustion) and 50% control obtained by SNCR.

PM Emissions Control

Particulate emissions arise from a variety of activities at cement manufacturing facilities, some of which are amenable to collection and control by add-on systems and some of which are fugitive in nature but which may be nevertheless reduced by mitigation methods. Dust sources amenable to collection and control include crushing, mixing and storage of raw materials, clinker production and cooling, finish grinding, and packaging. Of these sources, the largest single point of emissions are the stack emissions from the kiln including the feed system, fuel firing, and clinker cooling and handling systems. Fugitive emission come from quarrying and primary crushing of raw materials, storage and handling of raw materials, fuel, clinker, and finished product, and from vehicle traffic.

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Fugitive dust emissions are best controlled by efficient site design and lay-out as well as proper maintenance and operation of equipment to reduce spillage and air leakage from collection systems. These can be addressed appropriately in a dust mitigation plan and operation and maintenance plan. Plan elements may include open pile wind protection, use of water spray or chemical dust suppressors, paving, road wetting, and housekeeping requirements, and humidification of stockpiles. Additional measures may include enclosing or encapsulating dusty operations such as grinding, screening and mixing, covering conveyors and elevators, vacuum systems to prevent formation of diffuse dust from spillage during maintenance operations, and flexible filling pipes for dispatch and loading processes. Particularly dusty operations may require ventilation and collection by a control device similar to that for stack emissions.

Various systems have been employed in the cement industry to control point source or stack emissions in the past, but the predominant means of add-on particulate control currently in use are either fabric filtration (bag houses), electrostatic precipitation (ESP) or a combination of the two (hybrid filters). Hybrid filters are often ESP systems that have been modified to include a bag house in order to extend the useful life of the control device. In some cases a cyclonic separator may be used to remove larger particulate matter upstream of these fine particulate control devices.

Electrostatic precipitators (ESPs) generate an electrostatic field across the path of particulate matter in the air stream. The particles become negatively charged and then migrate to positively charged collection plates downstream of the electrostatic field. The plates are vibrated, tapped or shaken periodically to remove the collected material on a cycle optimized to minimize re-entrainment of the particulate matter. ESPs can operate effectively in conditions of high temperature (up to 750°F) and high humidity. Performance is impaired by particulate build-up on the electrodes forming an insulating layer and thereby reducing the electric field. This is most likely to happen with high chlorine or high sulfur fuel or raw materials forming alkali metal chlorides and sulfates. Explosion risks may also arise in conditions of high CO concentrations in exhaust gas.

Fabric filters are very efficient at dust collection, with the basic principle of a fabric membrane that allows the gas to pass but retains particulate. The most common large scale systems use hanging bags arranged geometrically across the top of a box or chamber, hence the name "bag house." Dust is deposited both on the surface and within the fabric, and in time the dust itself becomes the dominant filtering medium. Periodic cleaning of the fabric membrane is required as dust builds up and resistance to gas flow increases. The most common cleaning methods are compressed air pulsing, reverse airflow, mechanical shaking or vibration. Usually baghouses have multiple chambers that can be isolated in case of bag failure, and to maintain efficiency during the cleaning cycle. Filter bags are available in a variety of woven and nonwoven fabrics with some synthetic fabrics that can operate effectively at temperatures above 500°F.

TACs Emissions Control

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The TACs addressed in the proposed regulation as well as the federal NESHAP come in a variety of forms, so that control thereof is equally varied. The addition of adsorptive materials to the production process can be utilized to adsorb organic compounds, ammonia and ammonium compounds, HCl and mercury. The removal of toxic compounds that are emitted in solid form such as lead, beryllium and chrome is also increased slightly by the use of activated carbon. Acidic compounds can be removed through use of scrubbers which either spray caustic liquid into the kiln itself or into a separate reaction chamber downstream of the kiln. Alternatively, dry lime can be utilized in place of the caustic solution. Dioxins and furans are controlled by activated carbon or through operational controls such as maintaining a lower inlet temperature to the baghouse or other particulate abatement device.

Adsorption addition refers to adding lime or activated carbon to the cement manufacturing process in either a wet or dry form when raw materials are mixed prior to entering the kiln, or directly incorporated into the clinker formation process. The lime may be calcium oxide (CaO) or any of the various chemical and physical forms of quicklime, hydrated lime, or hydraulic lime. Dry scrubbing is another term for the addition of dry CaO and this has already been implemented to a degree at Lehigh. Two raw mills are situated immediately prior to final mixing of the raw materials and test results show a decrease in emissions when these are operating due to the increased addition of pulverized limestone into the flue gas. A suspension of hydrated lime in water may be sprayed into the cement kiln flue gas to reduce emissions and is called lime slurry injection (LSI). Lehigh obtained a permit from the District in 2010 to add LSI to their process (injection point at the last stage of the preheater/precalciner) and the system has been installed and used on a trial testing basis. The facility is awaiting county approval before beginning full scale operation.

Organic compounds, ammonia and ammonium compounds, HCl, mercury, SO_2, and to a lesser extent, residual dust can be removed by adsorption by activated carbon. As stated above, activated carbon can be injected into the cement manufacturing process (ACI), or alternatively the kiln gases can be routed to packed beds or filters. In both cases, the saturated carbon is then added to the fuel mix in the kiln. Lehigh applied for a permit from the District to install ACI primarily to reduce emissions of mercury. The installation was completed and ACI was fully operational beginning in May 2011.

SO_2 Emissions Control

Similar to NOx, the formation of SO_2 is a product of the chemical make-up of the raw materials and fuel, as well as the high operating temperatures and oxygen concentration in the kiln. The production of SO_2 is more dependent on the sulfur content of fuel and raw materials however, whereas NOx formation is more dependent on combustion effects. Emissions of the two pollutants are interrelated due to the overlap of contributing factors. Process optimization measures are the first step towards reducing SO_2 emissions, including smoothing of kiln operation, choice and homogenization of the raw materials and fuel, and prevention of reducing conditions in the burning process by controlling the amount of available oxygen. When these optimization measures prove insufficient, add-on controls such as adsorption addition, carbon filtration, and wet scrubbing may be employed to further reduce emissions of SO_2.

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Wet scrubbing is another means of controlling SO_2 emissions which involves spraying a mixture of calcium carbonate and water countercurrent to the exhaust gas in a tower as an add-on control device. The calcium carbonate reacts to form calcium sulfate dihydrate, which is then separated and can replace gypsum as a modulating agent in the finished cement depending on the properties required. The liquid is recovered and reused in the wet scrubbing tower. Wet scrubbing also removes HCl, residual dust and to a lesser extent metal and ammonia emissions. This is the most commonly used method of desulfurization in coal fired power plants and its use is also well established in cement manufacturing, although more often at facilities where sulfur levels are high in the fuel or raw materials. Limitations on the use of this means of control would be increased energy consumption, increased CO_2 emissions, increased water consumption and risk of water contamination, and increased operational costs.

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4.0 Rule Under Consideration

Requirements

The District is considering adoption of Regulation 9, Rule 13 to achieve the maximum feasible, cost effective emissions reductions of NOx and PM in concert with efforts to bring the Lehigh facility into compliance with limits for TACs consistent with the federal NESHAP. As an existing facility, Lehigh is not subject to the criteria pollutant emissions standards of the amended NSPS. Significant modifications will be required to reduce TAC emissions, including additional controls such as LSI and ACI, as well as enhanced monitoring requirements. The emission limits proposed in Regulation 9, Rule 13 represent the maximum feasible NOx and PM controls as applied to an existing unmodified source. The equipment modifications necessary to meet the proposed NOx emission limit may result in some excess ammonia emissions. Ammonia is a TAC and a precursor to secondary particulate matter formation, for this reason an ammonia emission limit is included in the proposed rule. Additional requirements of the proposed rule address concerns over the present configuration of the emission point from the kiln, and the need for an enforceable fugitive dust control plan. The proposed effective date of September 9, 2013 corresponds with that of the amended NESHAP and NSPS.

Criteria Pollutant Emissions Limits

The District proposes the following emission limits for Portland cement manufacturing kilns:

- 2.3 pounds NOx per ton of clinker produced averaged over 30 days
- 0.04 pounds PM per ton of clinker produced averaged over 30 days
- 10 ppmv ammonia above baseline, dry at 7% oxygen averaged over 24 hours.

Where possible, limits and averaging times are expressed to maintain consistency with federal standards and represent the most stringent limits that Lehigh can achieve for these pollutants in a cost-effective manner. Staff has evaluated the controls required by the federal standards and has proposed these standards based on reasonably achievable emission rates for this facility. These emission limits will require the use of a continuous emission monitoring system (CEMS) or parametric monitors, as well as a means of monitoring and recording the production rates. CEMS, parametric monitors, and production monitoring requirements are detailed in the monitoring and records section of the rule. There is currently no commercially available CEMS for PM; however, there is a reasonable expectation that parametric monitoring equipment will become available before the federal standards requiring CEMS for PM go into effect in 2013. Lehigh has already installed a parametric monitor to measure ammonia and is currently calibrating and testing this equipment for quality assurance of the measurements. All CEMS and parametric monitors are required to comply with the provisions of the District Manual of Procedures, federal requirements, and to maintain records as provided in District Regulation 1.

An initial demonstration of compliance with these emission limits must be performed within 90 operating days of the effective date of the rule and repeated annually thereafter.

TAC Emissions Limits

The following emission limits are proposed to address TACs:

- 0.2 nanograms Dioxins/Furans (TEQ) per standard cubic meter, dry at 7% oxygen averaged over 24 hours
- 55 pounds Mercury per million tons of clinker produced averaged over 30 days
- 9 ppmv Total Organic HAP, dry at 7% oxygen averaged over 30 days
- 3 ppmv HCl, dry at 7% oxygen averaged over 30 days.

The proposed emissions limits are consistent with the federal NESHAP and will provide protection to nearby communities should the federal rules be delayed or overturned either through legislative efforts or pending litigation. Lehigh has already installed control equipment (LSI and ACI) and monitoring equipment (CEMS and parametric monitors) in order to meet the compliance date of the federal rules.

Opacity Standard

District staff proposes an opacity limit of 10 percent opacity lasting for no more than three minutes in any one hour period from any emission point or miscellaneous operation. Compliance with this standard will be facilitated through the implementation and maintenance of a Fugitive Dust Control Plan (FDCP). Elements of the FDCP include:

- List of potential emission sources
- Mitigation measures to minimize fugitive dust emissions
- Personnel training procedures
- Operation and maintenance procedures to minimize fugitive dust emissions

As part of Lehigh's recent Title V permit renewal, the District required Lehigh to develop and implement a FDCP to reinforce the facility's commitments to mitigate emissions of fugitive dust. Provisions for the submittal, public comment procedures, District review, and potential modifications to the FDCP are included in the proposed regulation to strengthen the enforceability of the measures contained in the plan. Under the terms of the proposed regulation,

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the FDCP must be submitted to the District for review within 90 days of the effective date of the rule, and once deemed complete will be available for a 30 day public comment period. Within 30 days of completion of the public comment period, the District will approve the plan or notify the facility should the plan be deemed to be inadequate. In this latter event, the notification will identify any inadequacies and recommend corrections. Additionally, the District may determine that the FDCP be modified at a subsequent date should physical alterations, changes in throughput, or a recent history of exceedences of opacity standard dictate such a change.

Emission Point Requirements

District staff is proposing that emissions from the kiln enter the atmosphere not less than 300 feet above grade. This will aid in dispersion of pollutants and facilitate more accurate and less costly monitoring of emissions. A Health Risk Assessment performed for Lehigh determined that the concentration of pollutants at the maximally exposed receptor would be greatly reduced by increasing the stack height to 300 feet. This was confirmed by preliminary modeling of SO2 emissions as described in the following paragraph. In general, a higher emission point allows emitted pollutants to be transported over a longer distance before reaching ground level. The concentration of pollutants decreases as the plume travels from the point of release and is dispersed by wind and other natural forces, greatly reducing health impacts. Structural constraints, dynamic back pressure on the plume, as well as aesthetics and compliance with local building codes place constraints on the actual height of the stack.

Sulfur Dioxide

On June 2, 2010, EPA established a new one-hour SO_2 ambient air quality standard which became effective on August 23, 2010. The new national standard, 0.075 ppmv, is considerably more stringent than the existing California ambient air quality standard, 0.25 ppmv. District staff is examining whether existing sources of SO_2, including Lehigh, have emissions sufficient to trigger an exceedance of the new ambient standard. Based on preliminary dispersion modeling according to EPA specified methodology, Lehigh may trigger an exceedance; however, these modeling results do not correlate well with local monitoring data. This is likely due to the complex terrain surrounding the Lehigh facility, which is not adequately accommodated by the AERMOD model. District staff is evaluating the potential of other models to more closely corroborate with existing monitoring and improve the accuracy of the modeled results. Currently Lehigh is limited by permit condition to SO_2 emissions of 481 pounds per hour.

As mentioned previously, the LSI and ACI systems recently installed at Lehigh will reduce SO_2 emissions and the elevated stack will greatly reduce ground level concentrations of this pollutant. No SO_2 emissions standard is being proposed in this rule at this time; however, should future modeling or monitoring results indicate the need for SO_2 reductions from the facility, an emissions standard will be proposed that ensures that Lehigh does not cause an exceedance of the new standard.

Potential Emissions Reductions

The proposed rule would limit emissions of NOx to 2.3 pounds per ton of clinker produced. This translates to a reduction in NOx emissions from the kiln of two tons per day or a 58% reduction over current levels. Lehigh is subject to the NESHAP emission limits and has already taken steps to meet these limits through application of the LSI and ACI systems detailed in the Technical Review section of this report. Operation of this equipment will have a side-benefit of reducing emissions of SO_2 over previous levels, although it would be difficult to estimate the exact reduction in SO_2 emissions.

Reductions in particulate matter emissions are more difficult to quantify. The Lehigh kiln currently emits at a rate only slightly above the proposed standard for PM which is consistent with the NESHAP standards for existing sources. Both the NESHAP and NSPS require CEMS or parametric monitors for particulate emissions and there is a reasonable expectation that this equipment will become available before the standards go into effect in 2013. Compliance with the FDCP provisions of the rule will also help to ensure the continued minimization of fugitive dust emissions. The proposed limit for NOx will decrease the potential for secondary particulate formation, and the proposed standard for ammonia emissions will limit potential secondary particulate formed by increased ammonia emissions resulting from NOx control.

As part of the 2010 Clean Air Plan, District staff developed a multi-pollutant evaluation method (MPEM) to evaluate the benefits of the proposed control measures contained in the plan. This MPEM can be used to calculate the emissions equivalence for NOx, SO_2, and ammonia to that of directly emitted PM2.5 in terms of the effect on the average increase in PM2.5 concentration in the air. The emissions reduction of NOx combined with the proposed ammonia emission standard would be equivalent to a PM2.5 emission reduction of 8.7 tons per year. This number would be slightly increased by the side-benefit reduction in SO_2 emissions mentioned previously.

Cost of Controls

Lehigh is undergoing major modifications at their facility to meet the federally-imposed NESHAP requirements. Regulation 9, Rule 13 is being proposed at this time to integrate controls to reduce NOx into Lehigh's planning process, as well as provide a backstop in the event that amendments to the NESHAP are delayed or rescinded. Some of the cost impacts are a result of the EPA mandates and some are the result of the District proposal. EPA evaluated the cost impacts of the final amendments to the NESHAP and NSPS in a document issued at the same time as those final documents. The costs are nationwide estimates, based on 140 existing and 16 new kilns, and actual costs may vary at individual facilities.

Using the EPA estimates for a similarly sized and configured kiln as exists at Lehigh, NOx control utilizing SNCR would have a capital cost of $2.3 million, and an annual operating cost of $700 thousand. Lehigh has provided an estimated capital cost consistent with this estimate that would result from the District proposal. Lehigh estimates that it will cost $2.5 million for

modifications necessary to meet the stack requirements of this rule. However, these modifications are being undertaken to reduce health risks sufficient to avoid notification requirements for Lehigh should production levels return to maximum capacity. Therefore, this cost should not be attributed entirely to the proposed rule. Ammonia emissions can be controlled by controlling the feed into the SNCR at no additional cost. Although an excess of ammonia may result in incrementally lower NOx emissions, excess ammonia may also result in secondary PM formation and higher costs.

In order to meet the NESHAP emission limits, Lehigh will need to install control equipment as well as CEMS or parametric monitors for each emission point from the kiln and clinker cooler. The baghouses at Lehigh are compartmentalized and have multiple emission points, so Lehigh plans to manifold these to allow individual monitoring points. Lehigh has installed a hydrated Lime injection system (LSI) as well as activated carbon injection (ACI) in order to meet the NESHAP emission limits. Both of these systems will have the side benefit of reducing SO_2. In addition to the control equipment, there are costs associated with monitoring and testing to verify compliance with the rule. CEMS will be required for NOx, and either O_2 or CO_2, although these are already in place by permit condition. Additional parametric monitors will be required for PM, ammonia, D/F, mercury, total organic hydrocarbons, and HCl, as well as installation of continuous flow rate monitors and production monitoring systems.

Costs of control equipment and monitoring to meet the NESHAP requirements are estimated to be $27-$32 million. Costs of control equipment and monitoring for elements of the proposed District rule not already required by the NESHAP would amount to $5 million.

Costs for implementation of the Fugitive Dust Control Plan are considered to be minimal. Most provisions are already in place as a condition of Lehigh's Title V permit. The requirements of the proposed rule are meant to codify the FDCP and improve enforceability. However, it is possible that the existing dust mitigation plan would be revised, and there may potentially be costs associated with modifications to the Permit to Operate for the facility.

5.0 Rule Development / Public Consultation Process

The District has developed rule language and it is attached to this workshop report. The proposal is based in part on federal regulations and existing regulations in other air districts in California. Staff has consulted with officials from Lehigh Southwest Cement Company, Portland cement industry experts, California Air Resources Board staff, and EPA staff during the preparation of this document.

A public workshop is the next step in the rule development process. The purpose of the workshop is to solicit comments from the public on the District's proposed Regulation 9, Rule 13. During the workshop, District staff will seek comments on issues discussed in this workshop report and will respond to questions about information set forth in this report. Staff will review and consider all comments received at the public workshop and revise the proposal as appropriate.

In addition, staff will prepare an analysis of environmental impacts under the California Environmental Quality Act, a socioeconomic analysis, and a final proposed rule and staff report that will be available for public review and comment prior to a public hearing before the District's Board of Directors.

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6.0 References

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17. US EPA; *Summary of Environmental and Cost Impacts of Final Revisions to Portland Cement New Source Performance Standards (40 CFR PART 60, subpart F);* Docket Number EPA-HQ-OAR-2007-0877; August 6, 2010.

18. Consultation with Mr. Henrik Wesseling and Mr. Scott Renfrew of Lehigh Southwest Cement Company, Mr. Timothy Matz of Lehigh Hanson, and Mr. Shane Alesi of Heidelberg Cement Group; October 12, 2010.

19. Bay Area Air Quality Management District; *Multi-Pollutant Evaluation Method Technical Document*, April 2010.

Citizen's Report on Cement Plant Regulation in the
San Francisco Bay Area
Gary Latshaw, Ph.D. May 20, 2012

This is an analysis of the 10-year health implications of the air pollution from the Lehigh Cement Plant using alternative emission scenarios. The analysis is based on documents from Bay Area Air Quality Management District (BAAQMD) and the Environmental Protection Agency (EPA). The primary results are summarized in the graph below.

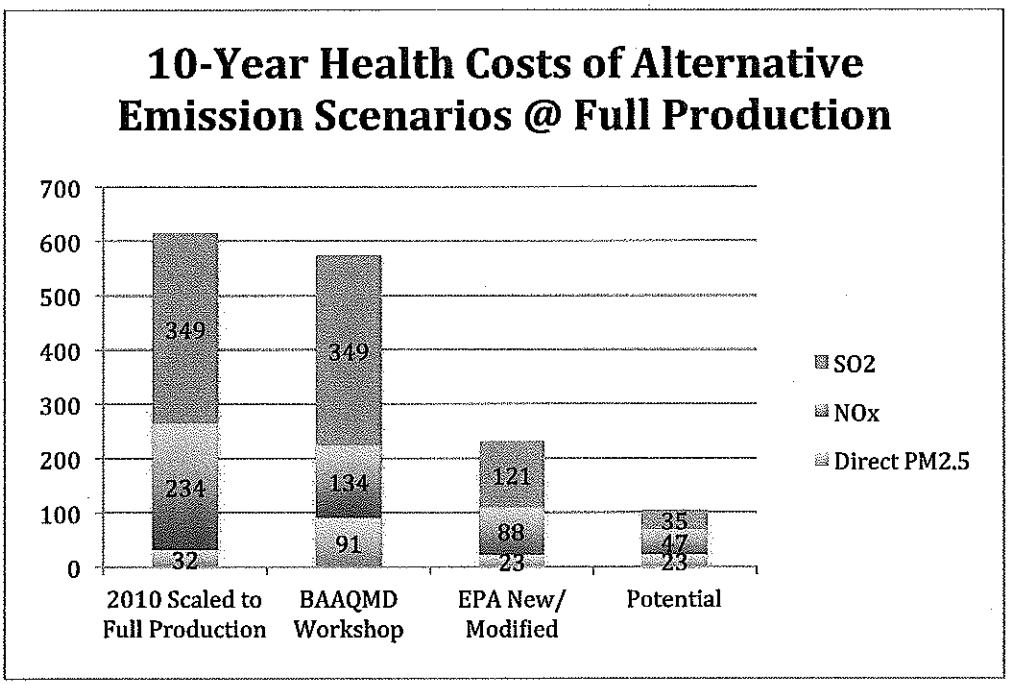

Figure 1 – 10-Year Health Costs (or Benefit of Removing Pollutants) All calculations presume full production of 1,600,000 tons of clinker.

As seen in the graph:

- The proposed regulations in the BAAQMD Workshop (WS) result in only minimal improvement (reduction) in health costs (41 million dollars) relative to actual 2010 emission ratios.
- The regulations by the EPA for "New and Modified" Plants would result in much greater improvement (reduction) to health costs (384 million dollars).
- Moreover, there are technologies that have not been fully investigated that could potentially provide even greater health savings (511 million dollars)
- The assignment of health costs to the emissions is based on the methodology in BAAQMD's Clean Air Plan 2010 (CAP). The use of the term "health costs" in this analysis is synonymous to the CAP's terminology "$$Benefit of Reducing".
- It is worth noting that Lehigh would emit substantial amounts of mercury. According the WS information: 55lb/ton-clinker with WS regulation, which, although less than the 2010 actual of 305 lb/ton, is not as protective as the EPA regulation for "New and Modified" Plants of 21 lb/ton-clinker. These health impacts do not include the effects of mercury, chromium VI, and other toxins.

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Gary Latshaw, Ph.D. May 20, 2012

While the state-of-the-art in assigning health implications vs. emission levels is only approximate, I believe it is accurate to state that the costs over 10 years are many hundreds of millions of dollars while the equipment to reduce them substantially have costs of tens of millions of dollars. The WS regulations have these specific deficiencies:

- The WS draft regulation does not address SO_2 at all.
- The WS draft regulation for particulates actually stipulates an emission ratio that is greater (less protective) than what was observed in 2010!
- The WS draft regulation for particulates should adopt the EPA's for "New and Modified" Plants.
- The analysis in developing the WS regulations did not seriously consider emission reduction ratios achieved by other plants such the Holcim Siggenthal PH kiln in Switzerland, and other plants in the United States (see Appendix E and Removal Techniques section). The WS draft suggests emission reduction from the plant using a Selective Non-Catalytic Reduction (SNCR). However, there are other technologies that could be employed in addition such as Selective Catalytic Reduction (SCR), use of alternative fuels, Coke filters, and others.

Certainly the more protective emission regulations will require capital and maintenance costs are the part of Lehigh, but the additional health benefits over 10-years are about half a billion dollars! The recommended regulation for Cement Plants that was specified in the BAAQMD Workshop (WS) does not provide sufficient health protection for Bay Area Residents. These health impacts are most likely understated since they don't include the effects of mercury, chromium VI, and other toxins. It is worth noting that Lehigh would emit substantial amounts of mercury. According the WS information: 55lb/ton-clinker with WS regulation, which, although less than the 2010 actual of 305 lb/ton, is not as protective as the EPA regulation for "New and Modified" Plants of 21 lb/ton-clinker.

The Federal Register in describing the regulations specifies proven technologies that have reduced emissions even more than those regulations. US Public Health Code 42 USC 7416 allows local government agencies to impose stricter regulations than the EPA regulation. In particular, since the Bay Area is already a non-attainment region regarding air quality, and the Lehigh Plant is unique in California for being adjacent to a large metropolitan area, I feel it is appropriate to regulate to the most technologically achievable emissions. Those technologies are apparently capable of removing almost all the emissions. As I explain in the section "Removal Techniques," I surmised after evaluating these materials that the regulations could be placed at on 10% of the SO_2 2010 emission ratios and at 20% of the NOx 2010 emission ratios. The Florida Division of Air Regulation (FLTE) did an analysis that provides evidence (see Appendix E) of actual regulations at many plants near my suggested SO_2 level in 2007.

Residents of the entire Bay Area would receive the health benefits from more protective regulations. While the residents near the plant have been the most vociferous in their requests for more protective measures, the health benefits will come to the entire community. The 500 million dollar savings due to reduced emissions would most likely far exceed the capital equipment and maintenance costs that Lehigh would incur.

costs for reduction are capital equipment costs, which would be amortized over 10-years or even longer. Note that over 99% of the health impact is due to NOx, SO_2 , and PM emissions. Table 5 summarizes the emission ratios used throughout.

Table 1 – BAAQMD Recommendations in Workshop Report (November 2011) based on EPA "Existing" Plants

Pollutant	$Costs/yr-ton	avg lb/ton clinker	tons/year	Cost /yr	Notes on Emission Ratios
SO2[1]	$37,900	1.150	920.00	$34,868,000	WS page 6 -2010 actuals
NOx	$7,300	2.300	1,840.00	$13,432,000	WS page 15
Direct PM2.5[2]	$456,400	0.014	19.84	$9,054,976	WS page 7
ROG	$4,800	2.550E-02	20.40	$97,920	assume 2010 WS actuals
Benzene	7,200	6.919E-03	5.53	$39,851	assume 2010 HRA actuals
Diesel PM2.5	$459,300	constant: 24.7 lb/yr	0.01235	$5,672	assume 2010 HRA actuals
1,3-Butadiene	$25,400	6.588E-05	0.05	$1,339	assume 2010 HRA actuals
Acetaldehyde	$500	8.300E-04	0.66	$332	assume 2010 HRA actuals
Formaldehyde	$1,100	4.522E-05	0.04	$40	assume 2010 HRA actuals
Ammonia	$53,500		0.00	$0	
CO2 equivalent	$28			N/A	
				$57,500,130	

[1]SO2 is not proposed to be regulated in this case. Actual emission ratios based on the WS report were used.

[2]The Direct PM 2.5 ratio is the product of the PM/clinker-ton times 62%. 62% is from the ARB and cannot necessarily assigned to this plant.

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Table 4 is provided for comparison to these alternative regulations as it represents the actual emission ratios (from WS: page 6) and then presumes full licensed production of 1,600,000 tons of clinker.

Table 4 -2010 actual ratios @ 1,600,00 tons Production

Pollutant	$Benefit/yr-ton	avg lb/ton clinker	tons/year	Cost/yr	Notes on Emission Ratios
SO2	$37,900	1.150E+00	920.00	$34,868,000	WS: page 6
NOx	$7,300	4.000E+00	3,200.00	$23,360,000	WS: page 6
Direct PM2.5	$456,400	8.680E-03	6.94	$3,169,242	WS: page 6*
ROG	$4,800	2.550E-02	20.40	$97,920	WS: page 6
Benzene	7,200	6.919E-03	5.53	$39,851	WS: page 6
Diesel PM2.5	$459,300	constant: 24.7 lb/yr	0.01235	$5,672	HRA Table E-2
1,3-Butadien	$25,400	6.588E-05	0.05	$1,339	HRA Table E-2
Acetaldehyde	$500	8.300E-04	0.66	$332	HRA Table E-2
Formaldehyde	$1,100	4.522E-05	0.04	$40	HRA Table E-2
Ammonia	$53,500		0.00	$0	
CO2 equivalent	$28			N/A	
				$61,542,395	

Table 5 shows the emission ratios used in creating the health costs. These emission ratios were multiplied by the licensed production of clinker (1,600,000 tons/yr). With the exception of "Potentially Achievable", the ratios in this table are from the WS. The "Potentially Achievable" are my estimate based on reading the literature.

Table 5 Alternative Regulations (Pounds of Pollutant/ton of clinker)

Pollutant	2010 Actuals	Draft Workshop	EPA New/ Modified	Potentially Achievable
SO2	1.15	None*	0.40	0.115
NOx	4.00	2.300	1.50	0.80
PM 2.5	0.014	0.04	0.01	0.01

Since no regulation of SO_2 was proposed, this analysis assumed that the 1.15 actual for 2010. The health impacts from these three pollutants represent 99% of the total impact.

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Removal Techniques

The rationale for recommending more protective measures for SO_2, NOx, and particulates (PM) than the WS recommended is presented subsequently. The following analysis argues that more protective techniques are available to reduce the emissions to even less than the EPA's "New/Modified".

SO_2

This analysis reveals that there is the potential to regulate Lehigh at a SO2 production ratio of 0.115 lb/ton or perhaps even more protective. At this production ratio, health benefits associated with SO_2 reduction of 314 million dollars would accrue over 10 years (relative to 2010). The 2010 actual ratio was 1.15 lb/ton. The WS has no regulation for SO2 stipulated. The EPA level for "New or Modified" Plants is 0.4 lb/ton.

As stated the WS does not specify any regulation on SO2. The WS (page 17) states that: "Based on preliminary dispersion modeling according to EPA specified methodology, Lehigh may trigger an exceedance of the new ambient standard; however, these modeling results do not correlate well with local monitoring data." The WS goes on to argue that the complex terrain makes these modeling results suspect. However, what is not discussed is that the majority of the monitoring is at a site that is close to trees and insulated from the Plant by hills. These trees will remove pollutants from the atmosphere and the hills will divert most of the pollutants away from the monitoring station.

SO2 is an extremely potent pollutant with a very high health benefit of removal – hundreds of millions of dollars over 10 years. In addition to the chemical having harmful health effects, it is also a precursor to the development of fine particulate (PM2.5) in the atmosphere, According to the FAR (page 54984): "Reducing SO2 emissions also reduces PM2.5 formation, human exposure, and the incidence of PM2.5-related health effects, among them premature mortality and cardiovascular and respiratory morbidity."

The NESHAP federal regulations require for "New and Modified" Cement Plants a limit of SO_2 emissions at 0.4 lb/ton of clinker. According to the table on page 6 of WS, Lehigh emitted 1.15 lb/ton of clinker of SO2 in 2010. The report indicates in several places that measures to reduce the production of other pollutants should also lower SO2 levels. I feel it is only reasonable to specify a regulation. It is noteworthy that Lehigh emitted 181 tons of SO_2 in 2008 (page 3 of WS). If production levels in 2008, which were not specified, were similar to 2010, then in 2008 the ratio of SO_2/ton of clinker would be 0.2 lb/ton of clinker – an emission ratio less than the proposed regulation.

The referenced statements below provide evidence that 90% of the SO_2 emissions (relative to 2010) can be removed. A removal efficiency of 90% relative to 2010 actuals would provide an emissions ratio of 0.115 lb/ton of clinker. However, the 2010 production of SO2 is 1.15 lb/ton, which has been reduced from completely unregulated

probably due to the injection of lime in the kiln. Starting at an already reduced level may not allow the post-processing methods to extract 90% of the remaining.

- Appendix A of the CAP (page A-26) states that retrofitting an SO_2 scrubber into the flue gas train would remove 90% of the SO_2.

- The WS identifies in some detail the way a SO2 can be controlled by scrubbing, but then never suggests any regulation of SO2. On page 14 of the WS:

    - "Wet scrubbing is another means of controlling SO_2 emissions which involves spraying a mixture of calcium carbonate and water countercurrent to the exhaust gas in a tower as an add-on control device. The calcium carbonate reacts to form calcium sulfate dihydrate, which is then separated and can replace gypsum as a modulating agent in the finished cement depending on the properties required. The liquid is recovered and reused in the wet scrubbing tower. Wet scrubbing also removes HCl, residual dust and to a lesser extent metal and ammonia emissions. This is the most commonly used method of desulfurization in coal fired power plants and its use is also well established in cement manufacturing, although more often at facilities where sulfur levels are high in the fuel or raw materials. Limitations on the use of this means of control would be increased energy consumption, increased CO_2 emissions, increased water consumption and risk of water contamination, and increased operational costs."

- The FAR has several examples of very high efficiencies in removing SO_2. Quoting the FAR in several places:

    - "We also note that SO2 scrubbers in the utility industry have consistently achieved 90 percent SO2 since since the 1970s. We see no technical reason that the same removal levels are not achievable in the cement industry." (page 55019)

    - "State commenters (60) and (72) state that the Ash Grove Chanute PH/C kiln in Kansas achieves less than 0.30 lb SO2/ton despite high sulfur in the raw materials without even using a wet scrubber. State commenter (60) states that this performance is attained using important innovations (The F.L. Smidth DeSOx system and Envirocare Micromist Lime system) not yet assessed by EPA. Attachments provided as part of the comment describe these technologies. State commenter (60) states that without controls, the proposed Chanute kiln would emit SO2 at the high rate of 12 lb/ton from raw material sources alone (*i.e.*, exclusive of fuel SO2). According to state commenter (60), using the described technology, actual emissions from the Ash Grove Chanute kiln are less than 0.25 lb SO2/ ton." (page 55016)[Note: The reduction at Ash Grove from an unregulated

production of 12 lb/ton to 0.25 lb/ton represents a 98% removal efficiency.]

- "According to State commenter (60), the Holcim Siggenthal PH kiln in Switzerland achieves approximately 0.05 lb SO2/ton using the POLVITEC coke filter installed in the 1990's. The POLVITEC system is used with various concurrent operational practices to control NH_3 (from an SNCR system), SO2, PM and metals. Among several functions, the coke filter captures the non-fuel SO2 generated in the PH. The coke is subsequently crushed and then burned with fuel in the main kiln burner. The SO2 from the PH then behaves like fuel SO2 and is incorporated into the clinker. Further details are available in an attachment submitted with the comment. The State commenter also states that SO2 emissions would be significantly less than 0.10 lb/ton of clinker. According to the State commenter, the Siggenthal plant emits much less SO2 than the average of Holcim cement plants in Switzerland and clearly less than 0.10 lb SO2/ton." (page 55016)

- "State commenter (60) states that good SO2 control will make it possible to employ more aggressive NO_X control and that the control of NO_X and SO2 will also minimize the formation of ozone and fine PM in the environment. State commenters (68, 70, 71) stated that State and local experts, who have had long experience with this industry, believe that the proposed NSPS limit for SO2 does not reflect what most plants are capable of achieving." (page 55016) [Note: NSPS refers to an emission ratio of 0.4 lb/ton.]

NOx

This analysis reveals that it is reasonable to regulate Lehigh at a NOx production ratio of 0.8 lb/ton (This represents an 80% reduction over 2010). At this production ratio, health benefits of 187.0 million dollars would accrue over 10 years (relative to 2010). The 2010 actuals were 4.0 lb/ton. The WS has suggested 2.3 lb/ton. The EPA level for "New or Modified" Plants is 1.5 lb/ton.

Nox is a major contributor to the formation of ozone, which is an established pollutant causing both ill health and eye irritation. Although the health benefit in reducing Nox is less than that for SO_2, there are substantial health benefits in regulating it to the maximum feasible level. Reducing the SO_2 emissions will aid in the removal of Nox.

Nox has two distinct sources in the production of clinker:

- Since nitrogen N_2 is a major component of air (80%), the high temperatures reached in the kiln cause N_2 to oxidize and form various nitrous oxides (Nox).

- Nitrogen compounds are frequently found in input materials and therefore contribute to the formation of Nox during the combustion process.

The referenced documents below provide ample evidence that 80% of these emissions (relative to 2010) can be removed. A removal efficiency of 80% relative to 2010 actuals would provide an emissions ratio of 0.8 lb/ton of clinker. Quotes are from the FAR.

- Selection of the fuel can greatly effect the production of Nox.
  - More volatile fuels burn more efficiently at a lower temperature and produce lower Nox during combustion.
  - Nitrogen in the combustion material will contribute to increased emissions. "Typically, fuel nitrogen in coals used by PH/PC kilns varies between 1.0 and 2.0 percent. This difference can impact the uncontrolled NOX by as much as 1.5 lb/ ton of clinker." (page 55014)
  - Given the above advantages of a low-volatile, low-nitrogen fuel, consideration should be made of returning to the use of natural gas, whose price has come down recently.

- "The results from the existing Radici Cementeria di Monselice PH kiln where emission reductions to values as low as 0.20 lb NOX/ton were demonstrated by installation of a SCR system. The supplier guaranteed reduction of 90 percent and realized reductions as high as 97 percent." (page 55010)

- "The commenter states that with the improved processes that lower uncontrolled NOX emissions and with the addition of SCR, NOX limits of 0.25–0.5 lb NOX/ton clinker are achievable." (page 55010 and 55011)

- "State commenter 60 states that based on the foregoing, reductions on the order of 75 percent are achieved by well-designed SNCR systems and 90 percent by SCR." (page 55010) [Note: This analysis is recommending only a 80% reduction.]

The high levels of emission removal were achieved by using two complementary technologies: Selective Catalytic Removal (SCR) and Selective Non-Catalytic Removal (SNCR). The WS discusses the two technologies, but requests only the SNCR be implemented. Even more reduction is probably available thorough the use of POLVITEC coke filter installed in the 1990's in Switzerland.

Particulates

This analysis adopts a PM emission ratio of 0.01 lb/ton. At this production rate, a 10-year savings in health costs of 90.6 million dollars would accrue. This ratio was adopted from the EPA's recommendation for "New and Modified" Plants. That ratio was based on the use of existing fabric and membrane technologies (page 54995 of the FAR). The 2010 production ratio was 0.014 lb/ton or only 40% greater than this recommendation. The WS

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specified a production ratio of 0.04 lb/ton – this is a ratio, which is more relaxed than the 2010 actuals.

The health impact of particulates is primarily due to the fine particulate component – particulates smaller than 2.5 um. There are no known measurements of the PM 2.5 fraction from Lehigh. In doing the calculations, it was assumed that the ratio of PM 2.5/PM was 62% - a figure from the California Air Resource Board that may not reflect the conditions at Lehigh.

Monitoring

The monitoring of the emissions from the plant must be upgraded as follows:

- All emissions should be released from a single stack.
- Continuous Monitoring of the gases must be adopted to quickly detect faulty equipment. Also, ammonia emissions must be monitored. The removal mechanisms for NOx can result in an inadvertent release of ammonia, which is not a problem at this time, so monitoring is essential in the future.
- Continuous Monitoring of particulate emissions must be adopted to quickly detect faulty equipment – in particular rips in the filter bags

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Appendix A – Color Coding and Abbreviation of References

(CAP) Clean Air Plan Volume 1, BAAQMD, Adopted Sept 15, 2010 by ABAG, MTC, BCDC http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/Plans/2010%20Clean%20Air%20Plan/CAP%20Volume%20I%20%20Appendices.ashx http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/Plans/2010%20Clean%20Air%20Plan/CAP%20Volume%20II_Sections%20A-F.ashx
AMEC Report: "Revised AB 2588 Health Risk Assessment 2005, Average 2008/2009, and 2013 Production Scenarios" (Lehigh/ AMEC Report) prepared by AMEC Geomatrix Note: This report was provided on a DVD by BAAQMD
(WS) Workshop Report by Robert Cave," BAAQMD Reg 9, Rule 13:…", November 2011" Bay Area Clean Air Plan Stationary Source Control Measure SSM-9 – Workshop Report November 2011" http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/Rules%20and%20Regs/Workshops/2011/0913_WR_111511.ashx?la=en
Emission Calculation based on AMEC Report, and WS Clinker Production, Table ES-2,
(FAR) Federal Register Vol 75, No. 174, Thursday, September 9, 2010, Rules and Regulations http://www.gpo.gov/fdsys/pkg/FR-2010-09-09/pdf/2010-21102.pdf
(FLTE) The Department of Environmental Protection, Division of Air Resources Management, Bureau of Air Regulation produced a report "Technical Evaluation Preliminary Determinations Draft BACT Determinations, CEMEX CEMENT COMPANY, BROOKSVILLE HERNANDO COUNTY" dated July 17, 2007. http://www.dep.state.fl.us/air/emission/construction/cemex/TEPD384A.pdf

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Pollutant Reduction Equipment
Appendix B

Input Materials

Aside from the equipment itself, the emissions will be dependent on the input materials used in the processing. The source of heating fuel and carbon material for the processing can be coke, coal, or natural gas. In general, natural gas will have fewer impurities such as sulfur or mercury. Various purities of coke and coal are available.

Injection of Absorbent Materials

Activated Charcoal or lime can be injected into the process to remove toxics such as mercury and control SO2. The type, amount and rate of injection will all effect the efficiency removal.

Selective Non-Catalytic Reduction (SNCR)

This technique involves the injection of an nitrogen rich chemical such as ammonia or urea into the exhaust streams. It is employed to remove NOx and is recommended in the WS.

Selective Catalytic Reduction (SCR)

This technique is similar to SNCR, but a catalyst is present. It operates at a lower temperature (570-700 F). SCR is a less tested technique and does require removal of dust. As pointed out in the WS, some plants do have both SNCR and SCR. Both of these techniques use the introduction of a nitrogen rich chemical and thus care must be taken that only minimal amounts of ammonia are emitted. This concern is called "ammonia slip."

Coke Filter

The entire exhaust stream can be filtered coke. The coke acts as an absorbent and removes pollutants. The highly efficient Swiss Plant Holcim Siggenthal PH has a POLVITEC coke filter.

Relative Value of Emission Reductions Based on MPEM

The MPEM can be used to compare the benefit of reducing the various air pollutants, as shown in Table 1-2. For this exercise, the MPEM was used to calculate the value of reducing one ton of each pollutant or precursor that is included in the methodology. The relative weight for each pollutant was then determined, using ROG as the unit of comparison. Since studies show that PM is the predominant cause of air pollution-related mortality, as discussed below, and mortality has by far the highest value ($6.9 million) among the health endpoints used in the MPEM, it is not surprising that the MPEM-derived weighting factor for PM reductions is much higher than for the other pollutants analyzed. These weighting factors are instructive for purposes of comparing the value of reducing the various pollutants. They can also be used to calculate the weighted tons of emissions reduced by various control measures for purposes of comparing their overall air quality and climate protection benefit.

Table 1-2. Dollar value of reducing one ton per year of each pollutant using MPEM.

Pollutant	$$ Benefit: Reducing One Ton Per Year	Weighting Factor *
ROG	$4,800	1.0
NOx	$7,300	1.5
Diesel PM2.5	$459,300	96.1
Direct PM2.5 (no diesel)	$456,400	95.5
SO2	$37,900	7.9
Ammonia	$53,500	11.2
Acetaldehyde	$5,300 ($500 plus $4,800 as ROG)	1.1
Benzene	$ 12,000 ($7,200 plus $4,800 as ROG)	2.5
1,3-Butadiene	$30,200 ($25,400 plus $4,800 as ROG)	6.3
Formaldehyde	$ 6,000 ($1,100 plus $4,800 as ROG)	1.2
CO2 equivalent	$28	0.03

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Supplemental Packet Item # 3 5/31/2012

This is an analysis of the 10-year health implications of the air pollution from the Lehigh Cement Plant using alternative emission scenarios. The analysis is based on documents from Bay Area Air Quality Management District (BAAQMD) and the Environmental Protection Agency (EPA). The primary results are summarized in the graph below.

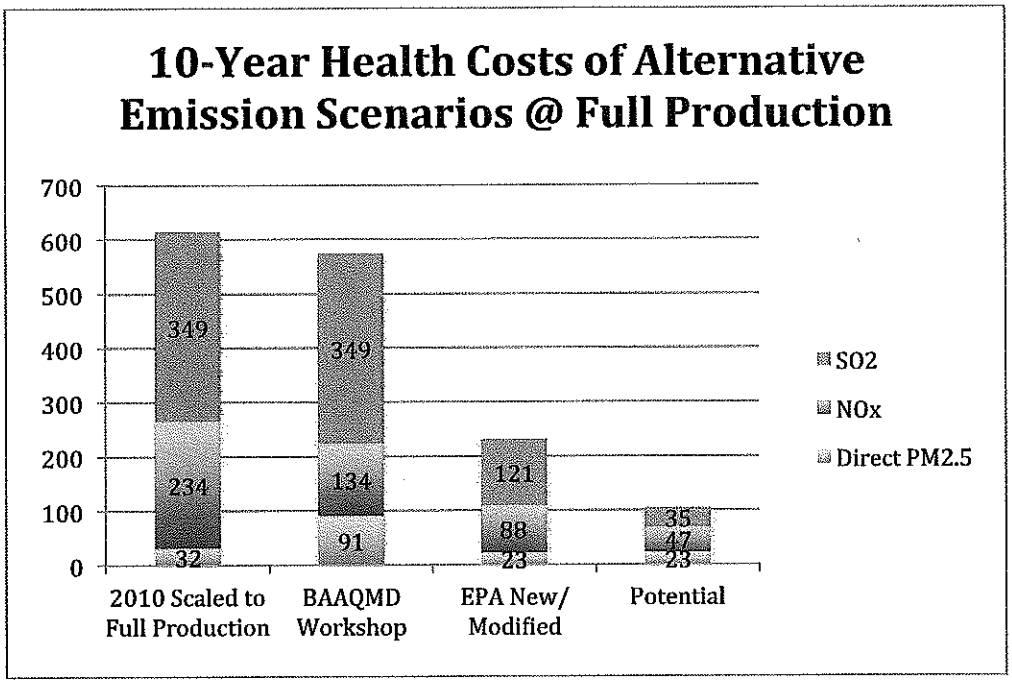

Figure 1 – 10-Year Health Costs (or Benefit of Removing Pollutants) All calculations presume full production of 1,600,000 tons of clinker.

As seen in the graph:

- The proposed regulations in the BAAQMD Workshop (WS) result in only minimal improvement (reduction) in health costs (41 million dollars) relative to actual 2010 emission ratios.
- The regulations by the EPA for "New and Modified" Plants would result in much greater improvement (reduction) to health costs (384 million dollars).
- Moreover, there are technologies that have not been fully investigated that could potentially provide even greater health savings (511 million dollars)
- The assignment of health costs to the emissions is based on the methodology in BAAQMD's Clean Air Plan 2010 (CAP). The use of the term "health costs" in this analysis is synonymous to the CAP's terminology "$$Benefit of Reducing".
- It is worth noting that Lehigh would emit substantial amounts of mercury. According the WS information: 55lb/ton-clinker with WS regulation, which, although less than the 2010 actual of 305 lb/ton, is not as protective as the EPA regulation for "New and Modified" Plants of 21 lb/ton-clinker. These health impacts do not include the effects of mercury, chromium VI, and other toxins.

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While the state-of-the-art in assigning health implications vs. emission levels is only approximate, I believe it is accurate to state that the costs over 10 years are many hundreds of millions of dollars while the equipment to reduce them substantially have costs of tens of millions of dollars. The WS regulations have these specific deficiencies:

- The WS draft regulation does not address SO_2 at all.
- The WS draft regulation for particulates actually stipulates an emission ratio that is greater (less protective) than what was observed in 2010!
- The WS draft regulation for particulates should adopt the EPA's for "New and Modified" Plants.
- The analysis in developing the WS regulations did not seriously consider emission reduction ratios achieved by other plants such the Holcim Siggenthal PH kiln in Switzerland, and other plants in the United States (see Appendix E and Removal Techniques section). The WS draft suggests emission reduction from the plant using a Selective Non-Catalytic Reduction (SNCR). However, there are other technologies that could be employed in addition such as Selective Catalytic Reduction (SCR), use of alternative fuels, Coke filters, and others.

Certainly the more protective emission regulations will require capital and maintenance costs are the part of Lehigh, but the additional health benefits over 10-years are about half a billion dollars! The recommended regulation for Cement Plants that was specified in the BAAQMD Workshop (WS) does not provide sufficient health protection for Bay Area Residents. These health impacts are most likely understated since they don't include the effects of mercury, chromium VI, and other toxins. It is worth noting that Lehigh would emit substantial amounts of mercury. According the WS information: 55lb/ton-clinker with WS regulation, which, although less than the 2010 actual of 305 lb/ton, is not as protective as the EPA regulation for "New and Modified" Plants of 21 lb/ton-clinker.

The Federal Register in describing the regulations specifies proven technologies that have reduced emissions even more than those regulations. US Public Health Code 42 USC 7416 allows local government agencies to impose stricter regulations than the EPA regulation. In particular, since the Bay Area is already a non-attainment region regarding air quality, and the Lehigh Plant is unique in California for being adjacent to a large metropolitan area, I feel it is appropriate to regulate to the most technologically achievable emissions. Those technologies are apparently capable of removing almost all the emissions. As I explain in the section "Removal Techniques," I surmised after evaluating these materials that the regulations could be placed at on 10% of the SO_2 2010 emission ratios and at 20% of the NOx 2010 emission ratios. The Florida Division of Air Regulation (FLTE) did an analysis that provides evidence (see Appendix E) of actual regulations at many plants near my suggested SO_2 level in 2007.

Residents of the entire Bay Area would receive the health benefits from more protective regulations. While the residents near the plant have been the most vociferous in their requests for more protective measures, the health benefits will come to the entire community. The 500 million dollar savings due to reduced emissions would most likely far exceed the capital equipment and maintenance costs that Lehigh would incur.

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The health benefits from the more protective regulations are, because of the limited information available, understated from what would likely be achieved. The CAP only treated ten pollutants (excluding CO2), and the emissions from the plant were only available for nine of those pollutants. This results in not treating the health costs from mercury, chromium VI, ammonia, and other pollutants with known health effects. The proposed regulations depart from BAAQMD's recommended regulations in the treatment of SO_2, NOx, and particulates (PM).

CO2 was not included in this analysis since although the effects of CO2 on climate change and health effects are real and significant, the CO2 emissions will occur either locally or somewhere else to produce the needed cement.

Diesel Truck Emissions

Also, neither this analysis nor the BAAQMD's analysis considers the impacts of the diesel truck traffic on the residents who live near the segments of Steven's Creek Blvd and Foothill Expressway where most of the truck traffic travels. In recent years, it has become evident to scientists that diesel exhaust has significant health effects to those who live near major diesel traffic routes.

Analysis

The subsequent tables (1-4) provide detailed the health impacts by each pollutant from Lehigh for different scenarios. Colors are used in the tables to indicate the source of information. Appendix A is a reference where all the sources are identified. An emission ratio is the amount of a pollutant emitted (in pounds) per ton of clinker produced. Clinker is the primary product of cement production. These tables assume the licensed production of 1,600,000 tons of clinker. The tables present the results for the primary pollutants: SO_2, NOx, and PM 2.5, which were described in Figure 1 along with minor contributions from other pollutants. The other pollutants are reactive organics (ROG), benzene, diesel PM2.5, 1,3-butadiene, acetaldehyde, formaldehyde, and ammonia. Appendix C shows the health impact factors (red) that have been used from the CAP.

In developing the health impact costs, emission ratios of ROG, Benzene, Diesel PM 2.5, 1,3-Butadien, Formaldehyde, and Ammonia were calculated using the emission values in the "Revised AB 2588 Health Risk Assessment 2005, Average 2008/2009, and 2013 Production Scenarios" (Lehigh/ AMEC Report) prepared by AMEC Geomatrix". This report was produced by the consulting firm of AMEC Geomatrix under contract to Lehigh. In particular, Table ES-2 (see Appendix D), was used to develop the emission ratios based on a low production of 847,000 tons of clinker in 2010. The emission ratios are displayed with a brown background. The values are much smaller than the top three pollutants.

The tables represent annual health costs, but decisions on "health costs" vs. "reduction equipment and maintenance costs" should consider a 10-year period since most of the

costs for reduction are capital equipment costs, which would be amortized over 10-years or even longer. Note that over 99% of the health impact is due to NOx, SO_2 , and PM emissions. Table 5 summarizes the emission ratios used throughout.

Table 1 – BAAQMD Recommendations in Workshop Report (November 2011) based on EPA "Existing" Plants

Pollutant	$Costs/yr-ton	avg lb/ton clinker	tons/year	Cost /yr	Notes on Emission Ratios
SO2[1]	$37,900	1.150	920.00	$34,868,000	WS page 6 -2010 actuals
NOx	$7,300	2.300	1,840.00	$13,432,000	WS page 15
Direct PM2.5[2]	$456,400	0.014	19.84	$9,054,976	WS page 7
ROG	$4,800	2.550E-02	20.40	$97,920	assume 2010 WS actuals
Benzene	7,200	6.919E-03	5.53	$39,851	assume 2010 HRA actuals
Diesel PM2.5	$459,300	constant: 24.7 lb/yr	0.01235	$5,672	assume 2010 HRA actuals
1,3-Butadiene	$25,400	6.588E-05	0.05	$1,339	assume 2010 HRA actuals
Acetaldehyde	$500	8.300E-04	0.66	$332	assume 2010 HRA actuals
Formaldehyde	$1,100	4.522E-05	0.04	$40	assume 2010 HRA actuals
Ammonia	$53,500		0.00	$0	
CO2 equivalent	$28			N/A	
				$57,500,130	

[1]SO2 is not proposed to be regulated in this case. Actual emission ratios based on the WS report were used.

[2]The Direct PM 2.5 ratio is the product of the PM/clinker-ton times 62%. 62% is from the ARB and cannot necessarily assigned to this plant.

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Table 2 assumes the plant operates with the EPA regulations for "New or Modified" Plants and is operating at full licensed capacity. The table shows 57.5 million dollars in annual health costs.

Table 2 EPA "New or Modified" Plants

Pollutant	$Costs/yr-ton	avg lb/ton clinker	tons/year	Cost /yr	Notes on Emission Ratios
SO2[1]	$37,900	0.40	320.00	$12,128,000	WS page 7
NOx	$7,300	1.500	1,200.00	$8,760,000	WS page 7
Direct PM2.5[2]	$456,400	0.01	4.96	$2,263,744	WS page 7
ROG	$4,800	2.550E-02	20.40	$97,920	assume 2010 WS actuals
Benzene	7,200	6.919E-03	5.53	$39,851	assume 2010 HRA actuals
Diesel PM2.5	$459,300	constant: 24.7 lb/yr	0.01235	$5,672	assume 2010 HRA actuals
1,3-Butadiene	$25,400	6.588E-05	0.05	$1,339	assume 2010 HRA actuals
Acetaldehyde	$500	8.300E-04	0.66	$332	assume 2010 HRA actuals
Formaldehyde	$1,100	4.522E-05	0.04	$40	assume 2010 HRA actuals
Ammonia	$53,500		0.00	$0	
CO2 equivalent	$28			N/A	
				$23,296,898	

[1]SO2 is now assumed to be regulated.

[2]The Direct PM 2.5 ratio is the product of the PM/clinker-ton times 62%. 62% is from the ARB and cannot necessarily assigned to this plant.

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Table 3 assumes that the plant is operating at licensed production levels of 1,600,000 tons of clinker. The emission ratios for SO_2 are 10% of 2010 actuals and NOx are 20% of 2010 actuals based on what has been achieved elsewhere. The PM ratio is directly from the EPA's regulation for "New or Modified" Plants

Table 3: Technologically Achievable

Pollutant	$Costs/yr-ton	avg lb/ton clinker	tons/year	Cost /yr	Notes on Emission Ratios
SO2	$37,900	0.115	92.00	$3,486,800	WS: page 6
NOx	$7,300	0.80	640.00	$4,672,000	WS: page 6
Direct PM2.5	$456,400	0.01	4.96	$2,263,744	WS: page 6*
ROG	$4,800	2.550E-02	20.40	$97,920	WS: page 6
Benzene	7,200	6.919E-03	5.53	$39,851	WS: page 6
Diesel PM2.5	$459,300	constant: 24.7 lb/yr	0.01235	$5,672	HRA Table E-2
1,3-Butadien	$25,400	6.588E-05	0.05	$1,339	HRA Table E-2
Acetaldehyde	$500	8.300E-04	0.66	$332	HRA Table E-2
Formaldehyde	$1,100	4.522E-05	0.04	$40	HRA Table E-2
Ammonia	$53,500		0.00	$0	
CO2 equivalent	$28			N/A	
				$10,567,698	

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Table 4 is provided for comparison to these alternative regulations as it represents the actual emission ratios (from WS: page 6) and then presumes full licensed production of 1,600,000 tons of clinker.

Table 4 -2010 actual ratios @ 1,600,00 tons Production

Pollutant	$Benefit/yr-ton	avg lb/ton clinker	tons/year	Cost/yr	Notes on Emission Ratios
SO2	$37,900	1.150E+00	920.00	$34,868,000	WS: page 6
NOx	$7,300	4.000E+00	3,200.00	$23,360,000	WS: page 6
Direct PM2.5	$456,400	8.680E-03	6.94	$3,169,242	WS: page 6*
ROG	$4,800	2.550E-02	20.40	$97,920	WS: page 6
Benzene	7,200	6.919E-03	5.53	$39,851	WS: page 6
Diesel PM2.5	$459,300	constant: 24.7 lb/yr	0.01235	$5,672	HRA Table E-2
1,3-Butadien	$25,400	6.588E-05	0.05	$1,339	HRA Table E-2
Acetaldehyde	$500	8.300E-04	0.66	$332	HRA Table E-2
Formaldehyde	$1,100	4.522E-05	0.04	$40	HRA Table E-2
Ammonia	$53,500		0.00	$0	
CO2 equivalent	$28			N/A	
				$61,542,395	

Table 5 shows the emission ratios used in creating the health costs. These emission ratios were multiplied by the licensed production of clinker (1,600,000 tons/yr). With the exception of "Potentially Achievable", the ratios in this table are from the WS. The "Potentially Achievable" are my estimate based on reading the literature.

Table 5 Alternative Regulations (Pounds of Pollutant/ton of clinker)

Pollutant	2010 Actuals	Draft Workshop	EPA New/ Modified	Potentially Achievable
SO2	1.15	None*	0.40	0.115
NOx	4.00	2.300	1.50	0.80
PM 2.5	0.014	0.04	0.01	0.01

Since no regulation of SO_2 was proposed, this analysis assumed that the 1.15 actual for 2010. The health impacts from these three pollutants represent 99% of the total impact.

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Removal Techniques

The rationale for recommending more protective measures for SO_2, NOx, and particulates (PM) than the WS recommended is presented subsequently. The following analysis argues that more protective techniques are available to reduce the emissions to even less than the EPA's "New/Modified".

SO_2

This analysis reveals that there is the potential to regulate Lehigh at a SO2 production ratio of 0.115 lb/ton or perhaps even more protective. At this production ratio, health benefits associated with SO_2 reduction of 314 million dollars would accrue over 10 years (relative to 2010). The 2010 actual ratio was 1.15 lb/ton. The WS has no regulation for SO2 stipulated. The EPA level for "New or Modified" Plants is 0.4 lb/ton.

As stated the WS does not specify any regulation on SO2. The WS (page 17) states that: "Based on preliminary dispersion modeling according to EPA specified methodology, Lehigh may trigger an exceedance of the new ambient standard; however, these modeling results do not correlate well with local monitoring data." The WS goes on to argue that the complex terrain makes these modeling results suspect. However, what is not discussed is that the majority of the monitoring is at a site that is close to trees and insulated from the Plant by hills. These trees will remove pollutants from the atmosphere and the hills will divert most of the pollutants away from the monitoring station.

SO2 is an extremely potent pollutant with a very high health benefit of removal – hundreds of millions of dollars over 10 years. In addition to the chemical having harmful health effects, it is also a precursor to the development of fine particulate (PM2.5) in the atmosphere, According to the FAR (page 54984): "Reducing SO2 emissions also reduces PM2.5 formation, human exposure, and the incidence of PM2.5-related health effects, among them premature mortality and cardiovascular and respiratory morbidity."

The NESHAP federal regulations require for "New and Modified" Cement Plants a limit of SO_2 emissions at 0.4 lb/ton of clinker. According to the table on page 6 of WS, Lehigh emitted 1.15 lb/ton of clinker of SO2 in 2010. The report indicates in several places that measures to reduce the production of other pollutants should also lower SO2 levels. I feel it is only reasonable to specify a regulation. It is noteworthy that Lehigh emitted 181 tons of SO_2 in 2008 (page 3 of WS). If production levels in 2008, which were not specified, were similar to 2010, then in 2008 the ratio of SO_2/ton of clinker would be 0.2 lb/ton of clinker – an emission ratio less than the proposed regulation.

The referenced statements below provide evidence that 90% of the SO_2 emissions (relative to 2010) can be removed. A removal efficiency of 90% relative to 2010 actuals would provide an emissions ratio of 0.115 lb/ton of clinker. However, the 2010 production of SO2 is 1.15 lb/ton, which has been reduced from completely unregulated

probably due to the injection of lime in the kiln. Starting at an already reduced level may not allow the post-processing methods to extract 90% of the remaining.

- Appendix A of the CAP (page A-26) states that retrofitting an SO_2 scrubber into the flue gas train would remove 90% of the SO_2.

- The WS identifies in some detail the way a SO2 can be controlled by scrubbing, but then never suggests any regulation of SO2. On page 14 of the WS:

    - "Wet scrubbing is another means of controlling SO_2 emissions which involves spraying a mixture of calcium carbonate and water countercurrent to the exhaust gas in a tower as an add-on control device. The calcium carbonate reacts to form calcium sulfate dihydrate, which is then separated and can replace gypsum as a modulating agent in the finished cement depending on the properties required. The liquid is recovered and reused in the wet scrubbing tower. Wet scrubbing also removes HCl, residual dust and to a lesser extent metal and ammonia emissions. This is the most commonly used method of desulfurization in coal fired power plants and its use is also well established in cement manufacturing, although more often at facilities where sulfur levels are high in the fuel or raw materials. Limitations on the use of this means of control would be increased energy consumption, increased CO_2 emissions, increased water consumption and risk of water contamination, and increased operational costs."

- The FAR has several examples of very high efficiencies in removing SO_2. Quoting the FAR in several places:

    - "We also note that SO2 scrubbers in the utility industry have consistently achieved 90 percent SO2 since since the 1970s. We see no technical reason that the same removal levels are not achievable in the cement industry." (page 55019)

    - "State commenters (60) and (72) state that the Ash Grove Chanute PH/C kiln in Kansas achieves less than 0.30 lb SO2/ton despite high sulfur in the raw materials without even using a wet scrubber. State commenter (60) states that this performance is attained using important innovations (The F.L. Smidth DeSOx system and Envirocare Micromist Lime system) not yet assessed by EPA. Attachments provided as part of the comment describe these technologies. State commenter (60) states that without controls, the proposed Chanute kiln would emit SO2 at the high rate of 12 lb/ton from raw material sources alone (*i.e.,* exclusive of fuel SO2). According to state commenter (60), using the described technology, actual emissions from the Ash Grove Chanute kiln are less than 0.25 lb SO2/ ton." (page 55016)[Note: The reduction at Ash Grove from an unregulated

production of 12 lb/ton to 0.25 lb/ton represents a 98% removal efficiency.]

- "According to State commenter (60), the Holcim Siggenthal PH kiln in Switzerland achieves approximately 0.05 lb SO2/ton using the POLVITEC coke filter installed in the 1990's. The POLVITEC system is used with various concurrent operational practices to control NH_3 (from an SNCR system), SO2, PM and metals. Among several functions, the coke filter captures the non-fuel SO2 generated in the PH. The coke is subsequently crushed and then burned with fuel in the main kiln burner. The SO2 from the PH then behaves like fuel SO2 and is incorporated into the clinker. Further details are available in an attachment submitted with the comment. The State commenter also states that SO2 emissions would be significantly less than 0.10 lb/ton of clinker. According to the State commenter, the Siggenthal plant emits much less SO2 than the average of Holcim cement plants in Switzerland and clearly less than 0.10 lb SO2/ton." (page 55016)

- "State commenter (60) states that good SO2 control will make it possible to employ more aggressive NO_X control and that the control of NO_X and SO2 will also minimize the formation of ozone and fine PM in the environment. State commenters (68, 70, 71) stated that State and local experts, who have had long experience with this industry, believe that the proposed NSPS limit for SO2 does not reflect what most plants are capable of achieving." (page 55016) [Note: NSPS refers to an emission ratio of 0.4 lb/ton.]

NOx

This analysis reveals that it is reasonable to regulate Lehigh at a NOx production ratio of 0.8 lb/ton (This represents an 80% reduction over 2010). At this production ratio, health benefits of 187.0 million dollars would accrue over 10 years (relative to 2010). The 2010 actuals were 4.0 lb/ton. The WS has suggested 2.3 lb/ton. The EPA level for "New or Modified" Plants is 1.5 lb/ton.

Nox is a major contributor to the formation of ozone, which is an established pollutant causing both ill health and eye irritation. Although the health benefit in reducing Nox is less than that for SO_2, there are substantial health benefits in regulating it to the maximum feasible level. Reducing the SO_2 emissions will aid in the removal of Nox.

Nox has two distinct sources in the production of clinker:

- Since nitrogen N_2 is a major component of air (80%), the high temperatures reached in the kiln cause N_2 to oxidize and form various nitrous oxides (Nox).

- Nitrogen compounds are frequently found in input materials and therefore contribute to the formation of Nox during the combustion process.

The referenced documents below provide ample evidence that 80% of these emissions (relative to 2010) can be removed. A removal efficiency of 80% relative to 2010 actuals would provide an emissions ratio of 0.8 lb/ton of clinker. Quotes are from the FAR.

- Selection of the fuel can greatly effect the production of Nox.
  - More volatile fuels burn more efficiently at a lower temperature and produce lower Nox during combustion.
  - Nitrogen in the combustion material will contribute to increased emissions. "Typically, fuel nitrogen in coals used by PH/PC kilns varies between 1.0 and 2.0 percent. This difference can impact the uncontrolled NOX by as much as 1.5 lb/ ton of clinker." (page 55014)
  - Given the above advantages of a low-volatile, low-nitrogen fuel, consideration should be made of returning to the use of natural gas, whose price has come down recently.

- "The results from the existing Radici Cementeria di Monselice PH kiln where emission reductions to values as low as 0.20 lb NOX/ton were demonstrated by installation of a SCR system. The supplier guaranteed reduction of 90 percent and realized reductions as high as 97 percent." (page 55010)

- "The commenter states that with the improved processes that lower uncontrolled NOX emissions and with the addition of SCR, NOX limits of 0.25–0.5 lb NOX/ton clinker are achievable." (page 55010 and 55011)

- "State commenter 60 states that based on the foregoing, reductions on the order of 75 percent are achieved by well-designed SNCR systems and 90 percent by SCR." (page 55010) [Note: This analysis is recommending only a 80% reduction.]

The high levels of emission removal were achieved by using two complementary technologies: Selective Catalytic Removal (SCR) and Selective Non-Catalytic Removal (SNCR). The WS discusses the two technologies, but requests only the SNCR be implemented. Even more reduction is probably available thorough the use of POLVITEC coke filter installed in the 1990's in Switzerland.

Particulates

This analysis adopts a PM emission ratio of 0.01 lb/ton. At this production rate, a 10-year savings in health costs of 90.6 million dollars would accrue. This ratio was adopted from the EPA's recommendation for "New and Modified" Plants. That ratio was based on the use of existing fabric and membrane technologies (page 54995 of the FAR). The 2010 production ratio was 0.014 lb/ton or only 40% greater than this recommendation. The WS

specified a production ratio of 0.04 lb/ton – this is a ratio, which is more relaxed than the 2010 actuals.

The health impact of particulates is primarily due to the fine particulate component – particulates smaller than 2.5 um. There are no known measurements of the PM 2.5 fraction from Lehigh. In doing the calculations, it was assumed that the ratio of PM 2.5/PM was 62% - a figure from the California Air Resource Board that may not reflect the conditions at Lehigh.

Monitoring

The monitoring of the emissions from the plant must be upgraded as follows:

- All emissions should be released from a single stack.
- Continuous Monitoring of the gases must be adopted to quickly detect faulty equipment. Also, ammonia emissions must be monitored. The removal mechanisms for NOx can result in an inadvertent release of ammonia, which is not a problem at this time, so monitoring is essential in the future.
- Continuous Monitoring of particulate emissions must be adopted to quickly detect faulty equipment – in particular rips in the filter bags

Citizen's Report on Cement Plant Regulation in the
San Francisco Bay Area
Gary Latshaw, Ph.D. May 20, 2012
Appendix A – Color Coding and Abbreviation of References

(CAP) Clean Air Plan Volume 1, BAAQMD, Adopted Sept 15, 2010 by ABAG, MTC, BCDC http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/Plans/2010%20Clean%20Air%20Plan/CAP%20Volume%201%20%20Appendices.ashx http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/Plans/2010%20Clean%20Air%20Plan/CAP%20Volume%20II_Sections%20A-F.ashx
AMEC Report: "Revised AB 2588 Health Risk Assessment 2005, Average 2008/2009, and 2013 Production Scenarios" (Lehigh/ AMEC Report) prepared by AMEC Geomatrix Note: This report was provided on a DVD by BAAQMD
(WS) Workshop Report by Robert Cave," BAAQMD Reg 9, Rule 13:…", November 2011" Bay Area Clean Air Plan Stationary Source Control Measure SSM-9 – Workshop Report November 2011" http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/Rules%20and%20Regs/Workshops/2011/0913_WR_111511.ashx?la=en
Emission Calculation based on AMEC Report, and WS Clinker Production, Table ES-2,
(FAR) Federal Register Vol 75, No. 174, Thursday, September 9, 2010, Rules and Regulations http://www.gpo.gov/fdsys/pkg/FR-2010-09-09/pdf/2010-21102.pdf
(FLTE) The Department of Environmental Protection, Division of Air Resources Management, Bureau of Air Regulation produced a report "Technical Evaluation Preliminary Determinations Draft BACT Determinations, CEMEX CEMENT COMPANY, BROOKSVILLE HERNANDO COUNTY" dated July 17, 2007. http://www.dep.state.fl.us/air/emission/construction/cemex/TEPD384A.pdf

Pollutant Reduction Equipment
Appendix B

Input Materials

Aside from the equipment itself, the emissions will be dependent on the input materials used in the processing. The source of heating fuel and carbon material for the processing can be coke, coal, or natural gas. In general, natural gas will have fewer impurities such as sulfur or mercury. Various purities of coke and coal are available.

Injection of Absorbent Materials

Activated Charcoal or lime can be injected into the process to remove toxics such as mercury and control SO2. The type, amount and rate of injection will all effect the efficiency removal.

Selective Non-Catalytic Reduction (SNCR)

This technique involves the injection of an nitrogen rich chemical such as ammonia or urea into the exhaust streams. It is employed to remove NOx and is recommended in the WS.

Selective Catalytic Reduction (SCR)

This technique is similar to SNCR, but a catalyst is present. It operates at a lower temperature (570-700 F). SCR is a less tested technique and does require removal of dust. As pointed out in the WS, some plants do have both SNCR and SCR. Both of these techniques use the introduction of a nitrogen rich chemical and thus care must be taken that only minimal amounts of ammonia are emitted. This concern is called "ammonia slip."

Coke Filter

The entire exhaust stream can be filtered coke. The coke acts as an absorbent and removes pollutants. The highly efficient Swiss Plant Holcim Siggenthal PH has a POLVITEC coke filter.

Relative Value of Emission Reductions Based on MPEM

The MPEM can be used to compare the benefit of reducing the various air pollutants, as shown in Table 1-2. For this exercise, the MPEM was used to calculate the value of reducing one ton of each pollutant or precursor that is included in the methodology. The relative weight for each pollutant was then determined, using ROG as the unit of comparison. Since studies show that PM is the predominant cause of air pollution-related mortality, as discussed below, and mortality has by far the highest value ($6.9 million) among the health endpoints used in the MPEM, it is not surprising that the MPEM-derived weighting factor for PM reductions is much higher than for the other pollutants analyzed. These weighting factors are instructive for purposes of comparing the value of reducing the various pollutants. They can also be used to calculate the weighted tons of emissions reduced by various control measures for purposes of comparing their overall air quality and climate protection benefit.

Table 1-2. Dollar value of reducing one ton per year of each pollutant using MPEM.

Pollutant	$$ Benefit: Reducing One Ton Per Year	Weighting Factor *
ROG	$4,800	1.0
NOx	$7,300	1.5
Diesel PM2.5	$459,300	96.1
Direct PM2.5 (no diesel)	$456,400	95.5
SO2	$37,900	7.9
Ammonia	$53,500	11.2
Acetaldehyde	$5,300 ($500 plus $4,800 as ROG)	1.1
Benzene	$ 12,000 ($7,200 plus $4,800 as ROG)	2.5
1,3-Butadiene	$30,200 ($25,400 plus $4,800 as ROG)	6.3
Formaldehyde	$ 6,000 ($1,100 plus $4,800 as ROG)	1.2
CO2 equivalent	$28	0.03

Hard Copy

5/31/2012

Supplemental Packet
Item # 3

Regional OpenSpace | Midpeninsula Regional Open Space District

County Planning Commission
c/o Ms. Marina Rush
Santa Clara County Planning Office
County Government Center
70 W. Hedding Street, 7th Floor, East Wing
San Jose, CA 95110

May 31, 2012

RE: Comments/ Clarifications related to the May 24, 2012 Planning Commission Hearing Concerning Lehigh Permanente Quarry Reclamation Plan Amendment Final Environmental Impact Report (SCH No. 201004 2063, Project File # 2250-13-66-10P)

On behalf of the Midpeninsula Regional Open Space District (District) I would like to provide the following comments to issues raised and discussed at the Planning Commission hearing related to the Final Environmental Impact Report for the Lehigh Permanente Quarry Reclamation Plan Amendment, held on May 24, 2012.

Selenium

A selenium concentration of 7.2 micrograms per liter was noted near the upper portion of Permanente Creek near the WMSA. It must be noted that this measurement does not represent background, as may be inferred from looking at the graphic presented. This sampling site receives drainage from the WMSA, and likely documents quarry related pollution in excess of the Regional Water Quality Control Boards Basin Plan water quality objective.

A Planning Commissioner had requested information be included to quantify selenium impacts to human health, following a prior conversation with Lehigh officials. This information was presented showing human health impacts at or above 300 micrograms per liter. While, this information is interesting for discussion, it does not negate that selenium pollution well above the Regional Water Quality Control Board Basin Plan objective to protect all beneficial uses of water is occurring.

Regarding selenium treatment, the County concluded that the quarry will meet water quality standards at the completion of reclamation. As the District and the SFRWQCB have previously stated, this conclusion remains speculative at best. The CH2M Hill study presented regarding treatment also concludes that there is an uncertainty regarding treatment, and further studies are needed because today too much is unknown. We recognize that two differing types of treatment are being discussed, but believe the CH2M Hill conclusion referenced above applies to both scenarios.

Planning staff also stated that the selenium issue is an existing historic condition since mining began. There is no evidence presented to substantiate this statement. This statement also seems to imply that the existing high levels of selenium pollution documented should be viewed as a baseline condition for the purposes of the EIR. The possibility exists that the high levels of selenium documented is instead a relatively recent phenomena, related to the recent deepening of the quarry floor and interception of groundwater, and the substantial new areas of quarry disturbance.

The quarry is presented as a "bedrock bowl" with no contact with the primary recharge and municipal groundwater aquifer on the Santa Clara Valley floor. The quarry geology is heavily faulted and folded. Groundwater has been identified as flowing within faults, fractures, and geologic contacts. There appear to be some substantial cracks in the bowl. Groundwater geology, hydrology, and chemistry have not been presented to adequately demonstrate that the Project will not degrade groundwater resources. Per the SFRWQCB comment letter of February 21, 2012, "The DEIR suggests that groundwater quality will not be impacted by reclamation; however there is inadequate analysis to make such a conclusion. Furthermore, given the Water Board staff's experience and knowledge of the geology of the area, we are concerned that groundwater is currently contaminated with selenium, and possibly metals."

What is known is that a whole lot of water has already been intercepted by quarrying activities, prompting Lehigh and/or Hanson to dewater without the appropriate permit, and that the flow rate intercepted has not diminished. In fact, per the DEIR groundwater flow intercepted will increase substantially with the additional lowering of the quarry floor, as proposed by the Project. The large and continuous volume of groundwater intercepted by quarry activities implies that this groundwater was previously flowing to somewhere. Where has not been established in the EIR.

References to samples from existing groundwater wells were presented to show that selenium has not historically impacted the vast majority of these wells. While this information is encouraging, it is possible, given recent extensive quarry disturbance, deepening of the quarry pit, and unauthorized discharges, that the selenium pollution documented is a more recent phenomenon, which has not yet been detected at the wells sampled.

Permanente Ridge Scenic Easement/ Visual Impacts

Planning staff stated that an analysis to restore the landslides that have impacted the Permanente Ridge Scenic Easement dedicated to the County (public) would cost too much to rebuild/restore, could potentially cause greater instabilities, and potentially greater visual impact, and have therefore not been undertaken. This analysis was not presented in the DEIR, so we cannot offer an opinion. The more pressing issue for us is that future impacts to this public easement must not be allowed to occur.

The geotechnical analysis presented in the DEIR appears to show the existing quarry slopes are problematic in their current configuration. Geological/ Geotechnical experts Cotton, Shires and Associates also question the technical basis for the DEIR finding (February 20, 2012). It is possible that slope conditions could be even worse than presented in the DEIR.

We do not feel that it is appropriate for the County and Quarry to allow this condition to persist well into the future, until final reclamation, as proposed. The EIR should include an analysis on how best to immediately protect this public resource.

Regarding the high cost estimate to fully rebuild and restore the "protected" ridge, we suggest that the County use the cost estimate, referred to by staff, to help establish a fair value for the impacts to the easement that have occurred, and that the County and public who hold the easement be adequately compensated.

EMSA

Planning staff stated that the County allowed quarry waste disposal at the EMSA because Lehigh was unable to continue mining without more storage, and because it was the only option. There were in fact other options. A rail line serves the facility; the waste material could be hauled away. Placement within the existing quarry pit is also an option.

The quarry waste dumped appears to have been dumped in a hurried fashion. Cotton, Shires and Associates note in their February 20, 2012 peer review letter, that typically, quarry waste is keyed and compacted as the waste pile is built, contrary to how the quarry waste pile appears constructed, i.e. simply dumped, with final shaping and perimeter keyways to be completed later. Plant production was at 50% production, yet the EMSA per Lehigh, is nearly completed. It appears that Lehigh hauled 6,500,000 tons of waste to the unpermitted EMSA in violation of their Reclamation Plan, and without penalty.

Economic Impacts

Lehigh submitted to the Planning Commission (Exhibit 5, supplemental packet) that beneficial impacts of the **Quarry** in the County and region can be reasonably projected to equal tens of millions of dollars or more on an annualized basis to support a Statement of Override determination that the County must make to accept the "significant unavoidable" project impacts identified in the EIR. We do not verify or dispute the values presented.

The point that we must make is that per Lehigh's past submittals (Diepenbrock Harrison, August 10, 2006) "the cement plant is a stand-alone facility that is operationally distinct from the quarry. The cement plant processes limestone not only from the quarry, but also from other sites. Indeed, when the Permanente limestone is exhausted, the cement plant will continue to operate by processing material from other sources." Per this statement, the positive economic impacts noted are a combined result of the quarry and the cement plant operation. The cement plant is not a part of the Project per the EIR. These beneficial economic impacts from the cement plant would continue well into the future, regardless of quarrying on site, and shouldn't be misconstrued or used to support a statement of override.

Similarly, Lehigh in their submittal to the Planning Commission for a Statement of Overriding Considerations (Exhibit 5, supplemental packet) that the **Quarry** currently generates approximately $2,465,259 in annual property taxes to the County and approximately $135,441 in total sales tax collections in the County. These figures appear to also blend the economic benefit of the quarry with the cement plant, which as stated repeatedly in the EIR, is not a part of the reclamation plan. As stated above, the beneficial economic impacts from the cement plant, per Lehigh, would continue well into the future, regardless of quarrying on site, and shouldn't be misconstrued or used to support a statement of override.

Costs for scenic degradation to the region, and air and water pollution impacts to humans and wildlife should all be analyzed, calculated, and presented in a thorough economic impact analysis, to balance the skewed analysis presented by Lehigh. The economic returns of the Project bring significant environmental impacts that have not been economically analyzed or calculated.

The cost benefits to Lehigh from violations should also be calculated. For example: nearly 6.5 million tons of quarry waste has been dumped at the EMSA per Lehigh. The WMSA also appears to have more quarry waste dumped than approved. The amount of additional quarry waste on top of the WMSA should be quantified. The DEIR estimates a waste to product ratio so the volume of quarry waste to usable product can be estimated. Another possible way to calculate is to use the 1.6 million ton average of cement grade limestone produced and multiply it by the years the EMSA and excess WMSA volumes took to accumulate. Useable product is assumed to have been processed into cement for sale. The economic value of these violations should be calculated and presented in the economic analysis to characterize the substantial financial benefit already realized by Lehigh.

Financial Assurance

We concur with the comments of the SFRWQCB that the financial assurance posted by Lehigh must include the cost of water treatment to assure that water quality objectives will be met upon reclamation.

In closing, the District believes that the FEIR is deficient in many critical areas as noted in these comments and our prior comments that we have submitted throughout the process. Additionally, inappropriate, incomplete, and misleading information continues to be interjected into the process. We respectfully request that the County Planning Commission deny the Permanente Quarry Reclamation Plan Amendment FEIR.

Sincerely,

Matt Baldzikowski
Resource Planner III

Cc: District Board of Directors
Stephen E. Abbors, District General Manager
Erin Garner, Chair, State Mining and Geology Board
Jim Pompy, Director, Office of Mine Reclamation
George Shirakawa, President, County of Santa Clara Board of Supervisors

FOR INDIVIDUALS

REQUEST TO SPEAK TO THE PLANNING COMMISSION

If you wish to address the Planning Commission, please fill out this form and give it to the Board Clerk.

DATE: 5-31-12 AGENDA ITEM NO. # 1 3

PRINT NAME: Jorge Perez

ORGANIZATION:

WRITTEN COMMENTS

If you would like to provide written comments for the record, but do not wish to address the Planning Commission orally, please write your comments below:

My name is Jorge Perez I been working on this company ~~for~~ since 1998 and I enjoy working ~~on~~ for lehigh hanson permanente. The reason why I come here is to suport Lehigh and all our Fellow employee. Also to ask to pass the reclamation plan to keep working on the permanente team Thanks.