Marisa Weber

From: PUBCOMMENT-OCC
Sent: Thursday, January 15, 2015 8:36 AM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number 8996

NSR 9246?

WH

From: 4lablady70@gmail.com [mailto:4lablady70@gmail.com]
Sent: Thursday, January 15, 2015 5:53 AM
To: DoNot Reply
Subject: Public comment on Permit Number 8996

REGULATED ENTY NAME HOLCIM TEXAS

RN NUMBER: RN100219286

PERMIT NUMBER: 8996

DOCKET NUMBER:

COUNTY: ELLIS

PRINCIPAL NAME: HOLCIM TEXAS LIMITED PARTNERSHIP

CN NUMBER: CN601231459

FROM

NAME: MS Patricia Brown

E-MAIL: 4lablady70@gmail.com

COMPANY:

ADDRESS: 5005 PROSPERITY ROW
MIDLOTHIAN TX 76065-8859

PHONE: 2404199520

FAX:

COMMENTS: Please accept my request to withdrawal my former request for a contested case hearing regarding the renew of Holcim's (Midlothian, TX) Air Permit (No. 8996) Thank you, Patricia A. Brown

MW

TCEQ Public Meeting Form

November 3, 2014

Holcim (Texas) Limited Partnership
Proposed Air Quality Permits 8996 and PSDTX454M4

RECEIVED
NOV 03 2014
AT PUBLIC MEETING

PLEASE PRINT

Name: Patricia Brown

Mailing Address: 5005 Prosperity Row Midlothian TX 76065

Physical Address (if different): same

City/State: _____ Zip: _____

E-mail addresses are subject to public disclosure under the Texas Public Information Act

Email: 4ladylady70@gmail.com

Phone Number: (940) 419-9580

- Are you here today representing a municipality, legislator, agency, or group? ☐ Yes ☑ No

  If yes, which one? _____

☑ **Please add me to the mailing list.**

☐ **I wish to provide formal *ORAL COMMENTS* at tonight's public meeting.**

☑ **I wish to provide formal *WRITTEN COMMENTS* at tonight's public meeting.**

(Written comments may be submitted at any time during the meeting)

Please give this form to the person at the information table. Thank you.

I would like to request a contested case hearing.

Patricia A Brown

To Whom It May Concern:

NSR 92407

RE: TCEQ permit application #8996

In reference to the above-cited application by HolcimUS for a permit to install SCR technology in one of its Midlothian kilns, the Arlington Conservation Council withdraws its request for a contested hearing.

Because of the uncertainties in the original application and the nature of the permitting process, in order to have any opportunity for further involvement or comment about the terms of the permit our only recourse was to file for a case hearing through TCEQ. Subsequent discussions with cement plant personnel by one of our members have rendered further delays unnecessary, and ACC hereby cancels its request.

Grace Darling

(for) Arlington Conservation Council

REVIEWED
APR 06 2015
By WH

2015 APR -7 AM 9:57
CHIEF CLERKS OFFICE

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Marisa Weber

From: PUBCOMMENT-OCC
Sent: Monday, December 01, 2014 7:42 AM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number PSDTX454M4

WH

From: darlingg@sbcglobal.net [mailto:darlingg@sbcglobal.net]
Sent: Monday, December 01, 2014 12:40 AM
To: donotreply
Subject: Public comment on Permit Number PSDTX454M4

REGULATED ENTY NAME HOLCIM TEXAS

RN NUMBER: RN100219286

PERMIT NUMBER: PSDTX454M4

DOCKET NUMBER:

COUNTY: ELLIS

PRINCIPAL NAME: HOLCIM TEXAS LIMITED PARTNERSHIP

CN NUMBER: CN601231459

FROM

NAME: Grace Darling

E-MAIL: darlingg@sbcglobal.net

COMPANY: Green Arlington Foundation and Downwinders at Risk EdFund

ADDRESS: 1316 S PECAN ST
ARLINGTON TX 76010-2535

PHONE: 2147098791

FAX:

COMMENTS: On behalf of Green Arlington Foundation and Downwinders at Risk Education Fund, I write to withdraw our request for a contested hearing re Permit #PSDTX454M4. We wish Holcim much success utilizing SCR technology to reduce CO2 emissions and look forward to seeing early reporting data to that effect. Grace Darling, Chair, DAREF Secretary-treasurer, GAF DAREF

Comments on:
The Amendment to State Air Quality Permit Number 8996,
Modification to Prevention of Significant Deterioration Air Quality
Permit Number PSDTX454M4

Submitted by Downwinders at Risk
July 11th, 2014
to the
Texas Commission on Environmental Quality
Office of the Chief Clerk
MC 105, P.O. box 13087
Austin, Texas 78711-3087

Downwinders at Risk is a 20-year old organization with a long history of regulatory involvement with the facility that's the subject of this permit application.

We represent local Midlothian residents such as rancher Sue Pope, who are directly affected by the pollution from Holcim's Midlothian cement plant because they live immediately adjacent to the plant's property, as Ms. Pope does (9/10's of a mile north at 476 Hidden Valley Trail Midlothian, Texas, 75104), or in close proximity of it (within one to two miles), and whose health and well-being have been, and continue to be, threatened by its routine operation.

We also represent residents who live in Cedar Hill, DeSoto, Duncanville, Arlington, Grand Prairie, Mansfield, Fort Worth, Dallas, and other communities whose health is directly affected by the voluminous pollution from Holcim's Midlothian cement plant because of the predominant wind direction as documented by TCEQ in numerous regulatory filings and findings. Our decades of official regulatory involvement with Holcim's operations are well established in the public record, as is Ms. Pope's eligibility for legal standing in matters regarding Holcim's operations governed by state and federal statutes.

We note for the record that, contrary to Title 30, Chapter 39, Subchapter H, Rule §39.405 of the Texas Administrative Code relating to Applicability and General Provisions of Public Notice, the permit applicant did not make "a copy of the application available for review and copying at a public place in the county in which the facility is located or proposed to be located on the first day of newspaper publication or any day thereafter. "

Although the official published public notice asserted a copy of the referenced permit application was available to the public at the A. H. Meadows Public Library, 922 South 9th Street in Midlothian, no such copy was present for the duration of the commenting period when members of Downwinders at Risk repeatedly requested it. Nor, as the official published notice also asserted, was a copy of the referenced permit application available at the TCEQ Region 4 office in Fort Worth when Downwinders at Risk members sought it out at that location. For these reasons we request the referenced permit application be found automatically administratively incomplete by TCEQ, and a new public notice and commenting period begun before consideration of the Holcim permit application on its merits by the Commission.

Should TCEQ proceed with a consideration of the referenced permit application that did not fulfill the legally binding public notice requirements as established by the Texas Administrative Code, we reserve the right to challenge the results of that consideration in court.

Per Texas Administrative Code RULE §39.602, as persons who are filing public comment or hearing requests on or before the deadline for filing public comment or hearing requests, Downwinders at Risk requests to be mailed any correspondence related to the referenced permit application from this day forward at the address listed below.

Downwinders at Risk is encouraged by Holcim's consideration of Selective Catalytic Reduction (SCR) technology as an economically and technologically feasible option for the control of Total Hydrocarbons.

Because of its demonstrated superior ability to also remove significant amounts of Particulate Matter, Carbon Monoxide, Ammonia, Dioxin/Furans, and Nitrogen Oxide pollution more effectively than either a new RTO or the Selective Non-Catalytic Reduction (SNCR) unit Holcim currently operates, Downwinders at Risk advocates the Texas Commission on Environmental Quality eventually approve a Holcim permit application request that specifically calls for the installation of an SCR unit at its Midlothian cement plant.

However, in its current form, Holcim's permit application is an unknown quantity that should not be approved. It allows the company to chose a specific control technology for THC removal only *after* the granting of the permit itself by TCEQ - a backwards and legally-questionable process that gives Holcim a blank check before the public can weigh the detailed pros and cons of its choice and provide meaningful comment.

Holcim is a Major Source of air pollution. This request is a Major Modification to its permit. Instead of allowing Holcim a cafeteria-style, post facto approach to the selection of what that Major Modification will entail, TCEQ should reject this permit application and require the company to choose a specific pollution control system, with detailed specifications, and specific estimates of pollution totals.

Because of the number of unknowns contained in the current version of the Holcim permit application, and the potential for increases in pollution from the facility, **we request a contested case hearing on this permit application as well as a public meeting on behalf of our members such as Sue Pope, and all our members who live adjacent to, in close proximity of, or immediately downwind of Holcim's Midlothian cement plant who are adversely affected by the pollution Holcim would or could release as a result of the referenced permit application to its current permit in a way not common to the general public.**

These members include populations of elderly residents like Ms. Pope, as well as children living adjacent to, or in close proximity of, or immediately downwind of Holcim's Midlothian cement plant whose health is more sensitive than the population as a whole to increased exposure to Particulate Matter, Sulfuric Acid, Nitrogen Oxide, and Carbon Monoxide pollution identified by the company as the consequence of granting its permit application request.

They also include members living adjacent to, or in close proximity of, or immediately downwind of Holcim's Midlothian cement plant, again like Ms. Pope, with pre-existing respiratory problems and illness, such as asthmatics, and those with compromised immune systems, whose health is more sensitive than the general public, and might be further impaired as a result of exposure to the increases in routine pollution identified by the company as the consequence of granting its permit application request.

I. Holcim's Permit Application Assumes RTO and SCR Technologies Have the Same Pollution Impacts Requiring the Same PSD Reviews

Despite the inclusion of SCR as an option in the permit application, **the increases in Particulate Matter, Sulfuric Acid and Carbon Monoxide pollution cited by Holcim as triggering a PSD review and permit seem to be completely predicated on the operation of a Regenerative Thermal Oxidizer.** In other words, the increases in pollution generated by the operation of an RTO are driving Holcim's PSD permit application that includes consideration of both an RTO and an SCR unit.

That being the case, **true BACT for the Holcim plant would be exclusion of RTO technology in favor of a technology that doesn't trigger those increases, or at least doesn't trigger as much of an increase in each category of pollution.** That technology is SCR.

Holcim must prove in its permit application that that both SCR and RTO technology will result in equally large Sulfuric Acid Mist, PM, NOx and CO pollution increases. It doesn't do this. Nowhere in the permit application is there a side-by side comparison of the specific emissions expected from the operations of an RTO versus an SCR unit. Holcim only assumes that any generic "oxidation process" will result in the exact same increases in pollution. But the operating record of both technologies belies this assumption. Decades of facts on the ground show there is a great deal of difference in the ability of RTOs to generate and control sulfuric Acid Mist, PM, NOx, and CO pollution versus SCR units, both in and outside of the cement industry.

In addition, TCEQ's examination of the two options Holcim has identified in its "a la carte" PSD permit application for better control of Total Hydrocarbons cannot be limited to only the THC removal efficiencies of the control technologies under consideration. It must also consider the co-benefits resulting from each. Multi-pollutant control strategies are preferable to single-purpose ones. These differences are also what make SCR the superior and necessary regulatory choice in this instance.

II. SCR Technology Achieves THC Compliance for Holcim Without Inherent Uncertainties

SCR units installed in European Cement plants are demonstrating the THC/VOC destruction efficiency of SCR is more than sufficient to address the Holcim problem with organics in its mined limestone.

The Cementeria di Monselice cement plant in Padova Province, Italy, has been operating an SCR system for almost ten years. In December 2006, the plant manager co-authored a report about the performance of the system, summarizing the environmental benefits that had been observed with its use ("High dust SCR solutions," Ulrich Leibacher, ELEX, Switzerland; Clemente Bellin, Cementeria di Monselice, Italy; AA Linero, PE, Tallahassee, Florida, International Cement Review, December 2006). Those benefits included the effect on VOC removal efficiencies:

> *"In addition, **75 % oxidation of VOC is recorded.** Almost all ozone precursors (NOX and VOC) can be eliminated from the stack emissions of Cementeria di Monselice with the installed SCR process."*

In a January 2014 interview for the publication Global Cement, Joseph Kitzweger, the plant manager of the LaFarge (now Holcim) cement plant in Mannersdorf, Austria using SCR commented that,

> *"When we installed the SCR we noticed that* ***it lowered our TOC emissions*** *as well as our SO_2. That was a nice bonus."*

ChemCat, a manufacturer of SCR units, concludes the technology **can achieve the same range of 80-90% removal on non-methane THCs as it can for Nitrogen Oxides** (http://elex-cemcat.com/faq/):

> *"SCR reduces NOx with ammonia to nitrogen and water by shifting the normal temperature level of the reaction from approx. 800-1100°C to 170 - 420°C. The active component, which is V_2O_5 has an oxidizing influence on VOCs, including ethane, SO_2, dioxins and furans and also elemental mercury.*
>
> ***...The other THCs (NMTHC) can be reduced by similar rates as NOx.*** *Dioxins and furans havethe same behavior, because they are chlorinated VOCs."*

SCR in other applications has shown aggressive THC removal efficiencies.

In 2006, the Manufacturers of Emission Controls Association (MECA) submitted a written statement to the U.S. EPA in October 2006 regarding newly proposed emission standards for internal combustion engines. In that statement, MECA reported the multi-pollutant benefits of SCR installations that were removing not only 90% plus of NOx, but also over 80% of carbon monoxide, and **over 70% of VOCs.**

In a 2008 paper on SCR tests in heavy duty diesel engines, ("Effects of a Zeolite-Selective Catalytic Reduction System on Comprehensive Emissions from a Heavy-Duty Diesel Engine" Z. Gerald Liu, Devin R. Berg, and James J. Schauer, ISSN:1047-3289, *Air & Waste Manage. Assoc.*, 2008) the authors **recorded an 86% THC removal rate**.

The most compelling evidence that SCR is economically and technically feasible for Holcim's compliance with the new National Emission Standards for Hazardous Air Pollutants for the Portland Cement Manufacturing Industry **is the fact that the company has included the technology as one of two options to be considered for that very purpose in its PSD permit application.**

On the other hand, **the status of RTOs as economically feasible, and therefore appropriate for removal of THCs at Holcim is completely dependent on the price of natural gas,** which is a variable hard to predict very far into the future. One only has to go down Highway 67 in Midlothian a few miles to the neighboring TXI cement plant to see an example of the fluctuating nature of RTO's reliability.

> *"A Regenerative Thermal Oxidizer (RTO) was installed on a nearby kiln.... However, as discussed in the permit information provided by TCEQ), after operating the RTO for a year, this facility found that* ***the operating costs were prohibitively expensive,*** *and requested that TCEQ modify the requirements.*

The requirements were eventually addressed by the State Office of Administrative Hearings for a contested case, and a settlement reached in July 15, 2005. Under the settlement, the facility continues to operate the RTO, ***but with an increase in CO****, a decrease in operating temperature sufficient to meaningfully reduce natural gas usage and electric consumption.*

In addition, ***a Best Available Control Technology analysis for Holcim*** *is included in Reference 2. Appendix F of this document contains cost information for RTO equipment at Holcim, and includes both capital cost and operating cost data. In September of 2005, TCEQ's estimate of the cost for the RTO was $9,376 per ton VOC; since then, increasing costs for the natural gas necessary to fuel the RTO have further reduced the cost effectiveness of the control device (costs for natural gas have increased more than 30% since the estimate was developed). Based on EPA's review of the technical and cost information provided by TCEQ, although operation of an RTO is technically possible,* ***the costs associated with an RTO are not considered to be economically feasible at this time."***
(Reasonably Available Control Technology (RACT) for VOC Controls for the Dallas - Fort Worth 8-Hour Ozone Nonattainment Area Technical Support Document Docket ID EPA-R06-OAR-2007-0524, June 2008)

While an argument can be made that the recent development of natural gas shale plays in Texas and elsewhere have made this issue moot, there are many factors that could drive gas prices back up to levels that would make the kind of RTO technology Holcim is considering prohibitively expensive once again in the near future.

Exporting of gas to other countries, rising demand for gas in power plants and vehicles, and new petrochemical plants relying on it as feedstock could all significantly increase prices for gas in the next five to 10 years, forcing Holcim to once again consider other options for THC removal.

For example, in April the U.S. Energy Information Administration estimated that the accelerating rate of coal plant retirements could cause natural gas prices to rise from $3.44 per million British thermal units (Btu) in 2012 to $5.91 per million Btu in 2025. **That's approximately the same price that made RTOs prohibitively expensive for Holcim to operate in 2005.**

In June, citing a slow refill of natural gas storage and increased switching to gas by generators, credit rating agency Moody's raised its natural gas price assumptions 13% for the rest of this year to $4.50/MMBtu. (Platts News Service, June 19, 2014). A recent Black & Veatch survey, ("2013 Strategic Directions in the North American Natural Gas Industry") concluded that natural gas prices would increase to a range between **$4.50 to $7.49 MMBtu in 2020.** A Charles River Associates study for Dow Chemical in February 2013 predicted gas exports could **raise the price of gas by 300% over then current levels** ("US Manufacturing and LNG Exports: Economic Contributions to the US Economy and Impacts on US Natural Gas Prices").

The unpredictability of the largest single cost in operating an RTO – an energy cost that could once again make operation "economically infeasible" - undermines its long-term reliability. Choosing SCR avoids this potential reliability problem while providing removal efficiencies for THC pollution that allows Holcim's Midlothian cement plant to comply with new NESHAP requirements.

III. Once THC Pollution is Reduced to Legal Levels, SCR is "BACT" for PM and CO compared to an RTO

A) Particulate Matter/Metals

In its permit application, Holcim estimates increases in Particulate Matter of 2.5 microns or less, Particulate Matter 10 microns or less, and Sulfuric Acid Mist as a result of its modification, although it doesn't estimate the amount of those increases. It concludes its existing wet scrubbers and "good combustion practices" are BACT for these increases.

But without knowing how much of an increase in these pollutants is expected, it's impossible to know if these existing controls are sufficient. It's precisely because of the unknown quantity of the PM pollution increases cited by Holcim that new PM control equipment should be required. We conclude that an SCR unit working in combination with existing equipment is actually BACT for addressing any increases in PM pollution while simultaneously pursuing a reduction in THC pollution.

SCR is known for its ability to reduce Particulate Matter. As noted in the EPA's Alternative Control Techniques document "SCR minimizes emissions of NH3, **a fine particulate matter precursor**..." It has the same effect on metals PM pollution.

> *"... SCR can oxidize Hg and make it more collectible in the dust control equipment. It is possible therefore to improve on the efficacy of Hg reduction by **dust withdrawal in conjunction with SCR.**"* ("Comments on Draft Alternative Control Techniques Document Update – NOx Emissions from New Cement Kilns" *Al Linero, PE. Florida Department of Environmental Protection, June 2006)*

SCR in heavy-duty ship engines has been observed to obtain **25-40% reductions in Particulate Matter pollution** ("Clean North Sea Shipping, SCR," http://cleantech.cnss.no/air-pollutant-tech/nox/selective-catalytic-reduction-scr/)

In describing the effects of SCR on retrofitted heavy-duty diesel engines, EPA states **"SCR systems are commonly used in conjunction with a DOC and/or DPF to reduce PM emissions"** (http://www.epa.gov/cleandiesel/technologies/retrofits.htm).

The diesel industry reports **PM reductions of up 50% with SCR** (Diesel Technology Forum, http://www.dieselforum.org/files/dmfile/SelectiveCatalyticReduction.pdf).

According to one manufacturer of SCR, "In heavy-duty trucks, SCR will **reduce Particulate matter (PM) emissions by 30–50%"** (http://www.factsaboutscr.com/scr/engine-control-standards.aspx).

A diesel engine manufacturer also reports **PM reductions of 30-50 percent.** (http://www.dieselforum.org/files/dmfile/SelectiveCatalyticReduction.pdf).

Moreover, it appears that it's the operation of an RTO, not an SCR unit, that's responsible for the PM pollution increases that Holcim is estimating will take place as a result of its modification.

How can one tell this in the permit application (besides the long record of SCR units removing PM pollution from exhaust streams)? RTO's are not known for their ability to enhance PM removal rates. **In fact, PM pollution is a threat to their effectiveness,** a consideration that should be paramount in their installation in cement kiln operation. According to power plant industry sources,

> "Although oxidizer systems are used primarily for the abatement of VOCs, all emission streams contain some quantity of particulate matter, and these particles can lead to bed fouling, performance degradation and even to dangerous and destructive fires. (http://www.reliableplant.com/Read/19688/abate-vocs,-or-pollutants-with-rmal-oxidizers)

Dealing with this fact requires additional control measures that would be unnecessary for an SCR unit, as the request from Holcim makes clear. An RTO manufacturer states that:

> "Larger amounts (of PM) may require a wet scrubber, fabric filtration or electrostatic precipitation system prior to RTO process entrance. Large amounts of fine condensable particles in the process stream may require the use of preheating prior to entering the RTO." (http://rto.american-environmental.us/Optimum_Thermal_Oxidizer_Operation.html)

And indeed, that's exactly the kind of additional requirements that Holcim states will be necessary to run its unnamed "oxidation process" at is Midlothian plant, i.e. upgrades to existing baghouses and reheating of the flue gases.

In contrast, there are now "high," "low" and "medium" dust SCR applications for cement plants, all currently operating or being built in Europe. Likewise there are SCR units that work at temperatures as low as 250 C so that no, or little re-heating is needed.

So what's causing the new PM pollution increases that Holcim states will requires a PSD permit ? Operation of an RTO.

RTOs and SCR units are not equal in their ability to produce or remove PM pollution. RTOs produce more of it, SCR units less. Yet the Holcim permit application treats them the same.

If the goal is to reduce PM pollution as much as possible while better controlling for THCs, then there's no question that SCR is the superior technology. It offers supplemental PM reduction whereas the RTO offers none, doesn't require additional PM control measures, or much, if any, reheating, and isn't threatened by PM overload. SCR is BACT for Holcim in capturing new PM pollution while also reducing THC pollution.

B. Carbon Monoxide

In its permit request, Holcim states that it expects an increase of 25% in Carbon Monoxide (CO) pollution as a result of "the oxidation of the THC that is present in the kiln exhaust stream" as well as an increase in natural gas use, plus an almost 58,000 ton per year increase in CO2. Again the company states that wet scrubbers alone and "good combustion practices" will be sufficient to control these increases. We disagree.

Once again, more than likely these numbers are based on operation of an RTO, not an SCR unit.

SCR catalysts are now able to operate at temperatures as low as **250C/482 F** ((http://www.durrenvironmental.com/NOXCS.asp "NOx Emission Control: Emission Origins and Available Control Solutions"), whereas RTO's must operate at very high temperatures of **850C/15-1600F** (Holcim Permit Application, p 7). **There's inherently more demand for natural gas and more combustion involved in the operation of an RTO than SCR unit.** It takes less energy and less combustion to operate an SCR. It therefore produces less CO.

In October 2006, the Manufacturers of Emission Controls Association (MECA) submitted a written statement to the U.S. EPA regarding newly proposed emission standards for internal combustion engines. In that statement, MECA reported **one of the multi-pollutant benefits of SCR installations was a removal rate of over 80% of carbon monoxide.**

Diesel engine manufacturers have identified **CO reductions as large as 50-90% with use of SCR.** (http://www.dieselforum.org/files/dmfile/SelectiveCatalyticReduction.pdf).

SCR manufacturers have **reported the same 50-90% CO removal rates.** (http://www. factsaboutscr.com/scr/engine-control-standards.aspx)

In addition, **reliance on an SNCR unit like the one Holcim currently operates at its Midlothian cement plant can also cause CO and CO2 increases**:

> *".... the use of ammonia-solution based SNCR for NOx control will adversely affect the oxidation of CO to CO2 because both reactions will compete for OH*radicals required for reduction of CO and NOx. One study revealed that a molar ratio of NH3to NOx of 0.4 increased CO emissions by up to 0.5 pounds per ton of clinker. When such ratio increased to 0.8 and 1.0,* ***the CO emissions were increased by up to 1.0 and 1.5 pounds per ton of clinker respectively.*** ("Prevention of Significant Air Quality Deterioration Review, Preliminary Determination" March, 2008 State of Georgia - Department of Natural Resources Environmental Protection Division - Air Protection Branch)

In this case, "good combustion practices" seem to translate to installation of SCR to prevent unnecessary CO and CO2 pollution increases, rather than doubling down on SNCR technology as Holcim is seeking permission to do in its permit application by insisting it can build a second SNCR unit for each kiln.

RTOs have higher temperatures and inherently need more combustion to work than an SCR unit, and the EPA states plainly that, ***"RTO systems do not reduce the levels of CO"*** (EPA-452/F-03-021 Air Pollution Control Technology Fact Sheet). Additionally, the above-cited TXI example shows **that RTOs can actually increase CO pollution over the status quo**, depending on how they're operated.

To prevent significant increases in CO pollution at Holcim's Midlothian cement plant while pursuing THC pollution reductions, SCR technology is BACT.

IV. Multi-Pollutant Benefits from SCR Outweigh Existing SNCR and Proposed RTO

A. Ammonia

Ammonia is a hazardous air pollutant and it can also transform in the atmosphere to ammonium-based fine particulate matter (PM), which has known adverse health effects and contributes to regional haze and visibility reduction.

Ammonia can be emitted in significant quantities in cement stack gases, originating from the combustion of coal in the cement kiln, as well as from the raw materials used to produce the cement.

At certain cement plants, like Holcim's, ammonia is intentionally sprayed into cement stack gases as the reducing agent for SNCR processes to control NOx emissions.

SNCR systems differ from SCR systems in that SNCR systems do not employ a catalyst to promote the reaction between ammonia and NOx. For this reason, SNCR systems are usually not as effective for NOx control as SCR systems, and **"emissions of unused ammonia in the stack gases (a.k.a ammonia slip) are usually higher for SNCR systems than SCR systems"** (*"Air Pollution Control A Design Approach," 3rd ed.* Waveland Press, 2002, C.D. Cooper and F. C. Alley, and "Trip Report on SCR Experiences at Solnhofer Portland Zementwerke, Cementeria di Monselice, and ASM Brescia Waste-to-Energy Plant." July 31, 2006 Al Linero 2006).

Data from the European SCR installations indicates that the SCR units are extremely effective at reducing ammonia emissions. The Solnhofer cement plant in Germany has reported that emissions of ammonia were greater than 20 mg/m3 with an SNCR system, but only 1 mg/m3 with the SCR system.

> *"The SCR installation has proven its multi-pollutant control capabilities. Beside the extremely high and efficient NOx removal capabilities, NH3 present in flue gas from raw material is completely used in the SCR process,* ***thus considerably lowering the aqueous ammonia consumption, the related operating cost, a fine particulate precursor and potential odorant"*** ("High dust SCR solutions." *International Cement Review,* December 2006. *U.* Leibacher).

The Monselice, Italy cement plant reported that ammonia emissions were 20-50 mg/m3 before installation of the SCR system, but only 1-6 mg/m3 after SCR installation.

Holcim already reports that it had to get "an alternate baseline for control of its ammonia slip" caused by their two existing SNCR units. Adding another SNCR unit at each kiln is likely to increase ammonia emissions. However, installation of an SCR unit working by itself or a hybrid SNCR-SCR unit could significantly reduce the ammonia pollution from Holcim. This is something that an RTO could not do.

B. Dioxins/Furans

Polychlorinated dibenzodioxins andpolychlorinated dibenzofurans, (Dioxins and Furans) are a special category of hydrocarbons and are classified as known human carcinogens by the EPA. Cement plants are significant dioxin and furan polluters. In a 2005 study published by Harvard University and University of California at Davis researchers, the cement industry ranked first out of420 industrial sectors analyzed in direct cancer risk per dollar of economic output. The high ranking of the cement industry was driven in large part the levels of dioxin and furans it emits.

Reports of the efficient destruction of dioxin and furans with SCR technology catalysts began as early as 1991, ("Dioxin Destruction in Catalysts for NOx Reduction (SCR-DeNOx)." *Chemosphere*, vol. 25, 1992." K.B. Carlsson) and have been recorded numerous times since then at facilities worldwide.

Greater than 99% destruction of dioxin and furans with an SCR catalyst was reported being achieved at a waste incinerator in the Netherlands ("The Shell System for NOx Removal and Dioxin Destruction from Incineration FlueGas – CRI Catalyst Company." 3rd International Symposium on Incineration and Flue Gas Treatment Technologies, Brussels, Belgium, July 2-4, 2001." O.L.Maaskant).

A 50 to 75% destruction of dioxins and furans was reported for an SCR catalyst at a metal smelting plant and **98% destruction with the SCR unit** at a waste incinerator ("Destruction of PCDD/Fs by SCR from flue gases of municipal waste incinerator and metal smelting plant," *Chemosphere*, 2007 Vol 66." M. B. Chang, K.H. Chi, S.H. Chang and J.W.Yeh) .

In a 2007 paper examining a wide variety of technologies to control dioxins and furans, the authors conclude that,

> ***"A method of selective catalytic reduction for the NOx gases can be also applied for the dioxins remediation.*** *The present evidence shows that the catalysts used in selective reduction of the NOx in the flue gas* ***suppressed the formation of dioxins by 85%*** *(Goemans et al., 2004). It proves that a single, effectively designed catalyst can be used in the removal of the oxides of nitrogen and dioxins (Liljelind et al., 2001)"*
> (Dioxins sources and current remediation technologies—A review"
> Prashant S. Kulkarni, João G. Crespo, and Carlos A.M. Afonso,
> Environment International, Vol 34, September, 2007)

RTO's are not even mentioned in the review.

In a November 2007 report, the U.S. EPA assessed NOx control technologies for cement kilns and stated that SCR units have the additional potential to decrease both VOC and dioxin and furan emissions, based on the recent SCR installations on cement kilns in Europe and also data collected in other industries (U.S. EPA. "Alternative Control Techniques Document Update – NOx Emissions from New Cement Kilns." EPA-453/R-07-006, November 2007.)

In describing the multi-pollutant advantages of SCR at the Monselice Italy cement plant over SNCR, Linero et al states that, *"In addition, 75 % oxidation of VOC was recorded and dioxin and furan were destroyed"* (High Dust SCR Succeeds at Cementeria di Monselice," Alvaro A. Linero Florida Department of Environmental Protection, Ulrich Leibacher ELEX AG, Schwerzenbach, Switzerland Clemente Bellin Cementeria di Monselice SPA, Monselice (Padova), Italia, December 2006).

Reporting at the 2nd Global Cement Conference on Environmental Technology for Cement & Lime taking place in London in March of this year, Franz-Josef Zurhove of the SCR Manufacturer Elex noted a 95% NO_x reduction is possible with the technology in a cement kiln along with ***"simultaneous VOC, dioxin and furans reduction and mercury oxidation."***

Another pollution control manufacturer, Götaverken Miljö of Sweden, reports that **SCR can *"reduce the concentration of dioxin to below 0.1ng TEQ/Nm"*** (http:// www.gmab.se/documents/ENG_DioxinremovalbyADIOX_Typicalapplications_lq.pdf).

The ability for SCR to remove significant amounts of dioxins and furans from a kiln's waste stream makes it the better choice than an RTO for installation at the Holcim's Midlothian cement plant.

C. Nitrogen Oxides

Holcim states in its permit request that it expects an increase in NOx but it doesn't provide any quantification of that increase. Because of this unknown, it's impossible to determine whether the company will be successful in controlling that increase with "excess capacity" from its existing SNCR unit or by building a second SNCR unit "if required" as Holcim asserts.

The fact that the company can neither put a number on the NOx increase in its PSD permit application, or list a specific control strategy to address it in the same document underlines the great uncertainty of the entire application itself.

Besides engendering increased ammonia slip by maxing out its current SNCR capability or adding a second SNCR unit to each kin, CO and CO2 pollution will also probably increase by using SNCR technology for the capture of NOx instead of SCR.

And like the other pollution increases cited in the Holcim application, this predicted rise in NOx from "combustion" is most likely tied to the operation of an RTO, not an SCR unit.

Regardless, for control of NOx pollution, there is no better technology for cement kilns in the world today than SCR.

European cement plants using SCR report reductions **from 80 to over 90%.** The Solnhofer, Germany plant reported **an 80% removal rate** for NOx pollution when it operated its SCR unit in the early part of this century. The plant manager of the Monselice, Italy cement plant using SCR installed in 2006 has **recorded a 95% removal rate** of NOx pollution. The Mergelstetten, Germany cement plant **reports an 85% removal rate** for NOx pollution from an SCR unit installed in 2010. The Rohrdorf, Germany cement plant **reports an 88-90% reduction in NOx** pollution from an SCR unit installed in 2011. At the **Holcim-owned** Joppa, Illinois long dry kiln where an EPA pilot project is currently being conducted, operators report an **80% removal rate for a retrofitted SCR system.** ("Is SCR Technology Coming (back) to Cement?" John Kline, World Cement, April 2013)

All of these SCR removal rates exceed Holcim's current NOx removal rates using SNCR by over 50%.

If new equipment is going to have to be installed to better control an unknown amount of new NOx pollution it should be state-of-the-art NOx control technology and not a redundant second-best SNCR unit. Ellis County is part of the ten-county DFW nonattainment area for ozone, which is currently classified as "serious," with a "severe" designation pending. Midlothian cement plants, including Holcim, have been subject to specific rules limiting their production of ozone precursors. Any new emissions of NOx from Holcim should be avoided.

SCR should now be mandatory when the potential for new NOx emissions is present, as it is in this permit application, especially given that we have no idea what the size of those new NOx emissions are going to be. Holcim has a less than stellar track record in predicting how well its NOx control strategies will work at the Midlothian cement plant, having been completely wrong about the need for them in the recent past, forcing the installation of SNCR by settlement agreement. Citizens need assurances that new NOx pollution will be addressed by the best technology now available for its capture. That's SCR.

Besides the retrofitted Joppa, Illinois cement plant that's demonstrated the effectiveness of SCR technology, Holcim also has the experience of its cement plant in Mannersdorf, Germany that combines SCR with an RTO and, according to a recent interview with the plant manager

> "...is capable of reducing Total Hydrocarbons by around 98 - 99%,
> while also cutting smog-forming Nitrogen Oxides by around 90%."
> The Mannerdorf SCR-RTO system is also capable of running in autothermal
> or "self-fuelling" mode, saving substantial amounts on energy costs.
> During the first year, the overall operating costs of he SCR in Mannersdorf
> were comparable to those of an SNCR." ("Global Cement," March 2014)

Besides combining SCR with an RTO to get maximum pollution reductions of a variety of pollutants, there is also the option of adding smaller SCR units to run in conjunction with the existing SNCR technology at the Holcim Midlothian plant, to produce so-called "hybrid systems."

According to University of Texas at Arlington researchers who studied SCR-SNCR hybrids ("Hybrid Systems" January 2011, unpublished) the benefits of such an arrangement include:

- higher NOx removal compared to SNCR alone (and often SCR alone, as well)
- lower NH_3 slip compared to SNCR alone (improved efficiency of chemical utilization),
- downsized SCR catalyst bed, which means lower operation and maintenance costs compared to SCR alone, and easier retrofit,
- potential elimination of the SCR ammonia injection system,
- reduced SO_2 oxidation, which lessens risks associated with both ammonium bisulfate formation and plume opacity associate with SO_3.

Manufacturers of SCR agree with this assessment:

> "A recent progression in system design is the Hybrid SNCR/SCR system approach. By combining the two technologies, improvements can be seen in chemical and catalyst utilization, making the hybrid combination often more flexible and effective than the sum of its parts. A Hybrid system utilizes lower temperature SCNR injection to provide improved NOx reduction while generating higher ammonia slip. The residual ammonia slip is the reagent for a smaller SCR reactor that removes the slip and reduces NOx while limiting the costs associated with a larger catalyst volume."
> (http://www.durrenvironmental.com/NOXCS.asp "NOx Emission Control: Emission Origins and Available Control Solutions")

As does the EPA:

"....the (EPA)notes that hybrid combinations of SNCR and SCR could be used in new cement kilns to achieve greater reductions than would be possible with SNCR alone."
National Association of Clean Air Agencies, "COMMENT ON PORTLAND CEMENT NSPS 2009"

No matter what the pollutant increase cited in Holcim's permit application, SCR is the best technology to address its reduction and control. To sanction the installation of anything less the best option would be to invite unnecessary pollution problems in a location where there have been far too many already.

We support the installation of SCR at Holcim and we urge the company to submit an application that specifically calls for that option as a substitute for this "placeholder" permit application. On its merits, we urge the TCEQ to reject the current application as being too general, with too many unknowns, and without sufficient assurances that estimated pollution increases will be adequately controlled.

Submitted by
Downwinders at Risk Education Fund
Grace Darling, Chair
Jim Schermbeck, Director
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A hard copy of these comments is being mailed to the Chief Clerk's office.

Downwinders at Risk Education Fund
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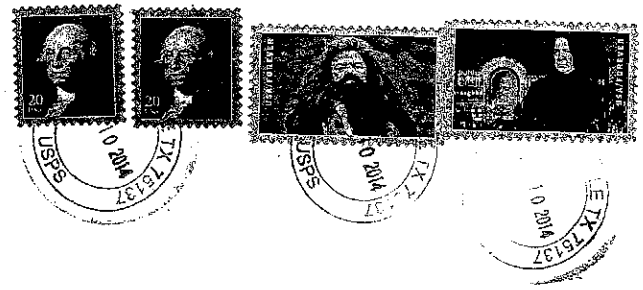

Texas Commission on Environmental Quality
Office of the Chief Clerk
MC 105, P.O. Box 13087
Austin TX 78711-3087

NSR 92407

Comments on:
The Amendment to State Air Quality Permit Number 8996,
Modification to Prevention of Significant Deterioration Air Quality Permit Number PSDTX454M4

Submitted by Downwinders at Risk
July 11th, 2014
to the
Texas Commission on Environmental Quality
Office of the Chief Clerk
MC 105, P.O. box 13087
Austin, Texas 78711-3087

Downwinders at Risk is a 20-year old organization with a long history of regulatory involvement with the facility that's the subject of this permit application.

We represent local Midlothian residents such as rancher Sue Pope, who are directly affected by the pollution from Holcim's Midlothian cement plant because they live immediately adjacent to the plant's property, as Ms. Pope does (9/10's of a mile north at 476 Hidden Valley Trail Midlothian, Texas, 75104), or in close proximity of it (within one to two miles), and whose health and well-being have been, and continue to be, threatened by its routine operation.

We also represent residents who live in Cedar Hill, DeSoto, Duncanville, Arlington, Grand Prairie, Mansfield, Fort Worth, Dallas, and other communities whose health is directly affected by the voluminous pollution from Holcim's Midlothian cement plant because of the predominant wind direction as documented by TCEQ in numerous regulatory filings and findings. Our decades of official regulatory involvement with Holcim's operations are well established in the public record, as is Ms. Pope's eligibility for legal standing in matters regarding Holcim's operations governed by state and federal statutes.

We note for the record that, contrary to Title 30, Chapter 39, Subchapter H, Rule §39.405 of the Texas Administrative Code relating to Applicability and General Provisions of Public Notice, the permit applicant did not make "a copy of the application available for review and copying at a public place in the county in which the facility is located or proposed to be located on the first day of newspaper publication or any day thereafter."

Although the official published public notice asserted a copy of the referenced permit application was available to the public at the A. H. Meadows Public Library, 922 South 9th Street in Midlothian, no such copy was present for the duration of the commenting period when members of Downwinders at Risk repeatedly requested it. Nor, as the official published notice also asserted, was a copy of the referenced permit application available at the TCEQ Region 4 office in Fort Worth when Downwinders at Risk members sought it out at that location. For these reasons we request the referenced permit application be found automatically administratively incomplete by TCEQ, and a new public notice and commenting period begun before consideration of the Holcim permit application on its merits by the Commission.

Should TCEQ proceed with a consideration of the referenced permit application that did not fulfill the legally binding public notice requirements as established by the Texas Administrative Code, we reserve the right to challenge the results of that consideration in court.

Per Texas Administrative Code RULE §39.602, as persons who are filing public comment or hearing requests on or before the deadline for filing public comment or hearing requests, Downwinders at Risk requests to be mailed any correspondence related to the referenced permit application from this day forward at the address listed below.

Downwinders at Risk is encouraged by Holcim's consideration of Selective Catalytic Reduction (SCR) technology as an economically and technologically feasible option for the control of Total Hydrocarbons.

Because of its demonstrated superior ability to also remove significant amounts of Particulate Matter, Carbon Monoxide, Ammonia, Dioxin/Furans, and Nitrogen Oxide pollution more effectively than either a new RTO or the Selective Non-Catalytic Reduction (SNCR) unit Holcim currently operates, Downwinders at Risk advocates the Texas Commission on Environmental Quality eventually approve a Holcim permit application request that specifically calls for the installation of an SCR unit at its Midlothian cement plant.

However, in its current form, Holcim's permit application is an unknown quantity that should not be approved. It allows the company to chose a specific control technology for THC removal only *after* the granting of the permit itself by TCEQ - a backwards and legally-questionable process that gives Holcim a blank check before the public can weigh the detailed pros and cons of its choice and provide meaningful comment.

Holcim is a Major Source of air pollution. This request is a Major Modification to its permit. Instead of allowing Holcim a cafeteria-style, post facto approach to the selection of what that Major Modification will entail, TCEQ should reject this permit application and require the company to choose a specific pollution control system, with detailed specifications, and specific estimates of pollution totals.

Because of the number of unknowns contained in the current version of the Holcim permit application, and the potential for increases in pollution from the facility, **we request a contested case hearing on this permit application as well as a public meeting on behalf of our members such as Sue Pope, and all our members who live adjacent to, in close proximity of, or immediately downwind of Holcim's Midlothian cement plant who are adversely affected by the pollution Holcim would or could release as a result of the referenced permit application to its current permit in a way not common to the general public.**

These members include populations of elderly residents like Ms. Pope, as well as children living adjacent to, or in close proximity of, or immediately downwind of Holcim's Midlothian cement plant whose health is more sensitive than the population as a whole to increased exposure to Particulate Matter, Sulfuric Acid, Nitrogen Oxide, and Carbon Monoxide pollution identified by the company as the consequence of granting its permit application request.

They also include members living adjacent to, or in close proximity of, or immediately downwind of Holcim's Midlothian cement plant, again like Ms. Pope, with pre-existing respiratory problems and illness, such as asthmatics, and those with compromised immune systems, whose health is more sensitive than the general public, and might be further impaired as a result of exposure to the increases in routine pollution identified by the company as the consequence of granting its permit application request.

I. Holcim's Permit Application Assumes RTO and SCR Technologies Have the Same Pollution Impacts Requiring the Same PSD Reviews

Despite the inclusion of SCR as an option in the permit application, **the increases in Particulate Matter, Sulfuric Acid and Carbon Monoxide pollution cited by Holcim as triggering a PSD review and permit seem to be completely predicated on the operation of a Regenerative Thermal Oxidizer.** In other words, the increases in pollution generated by the operation of an RTO are driving Holcim's PSD permit application that includes consideration of both an RTO and an SCR unit.

That being the case, **true BACT for the Holcim plant would be exclusion of RTO technology in favor of a technology that doesn't trigger those increases, or at least doesn't trigger as much of an increase in each category of pollution.** That technology is SCR.

Holcim must prove in its permit application that that both SCR and RTO technology will result in equally large Sulfuric Acid Mist, PM, NOx and CO pollution increases. It doesn't do this. Nowhere in the permit application is there a side-by side comparison of the specific emissions expected from the operations of an RTO versus an SCR unit. Holcim only assumes that any generic "oxidation process" will result in the exact same increases in pollution. But the operating record of both technologies belies this assumption. Decades of facts on the ground show there is a great deal of difference in the ability of RTOs to generate and control sulfuric Acid Mist, PM, NOx, and CO pollution versus SCR units, both in and outside of the cement industry.

In addition, TCEQ's examination of the two options Holcim has identified in its "a la carte" PSD permit application for better control of Total Hydrocarbons cannot be limited to only the THC removal efficiencies of the control technologies under consideration. It must also consider the co-benefits resulting from each. Multi-pollutant control strategies are preferable to single-purpose ones. These differences are also what make SCR the superior and necessary regulatory choice in this instance.

II. SCR Technology Achieves THC Compliance for Holcim Without Inherent Uncertainties

SCR units installed in European Cement plants are demonstrating the THC/VOC destruction efficiency of SCR is more than sufficient to address the Holcim problem with organics in its mined limestone.

The Cementeria di Monselice cement plant in Padova Province, Italy, has been operating an SCR system for almost ten years. In December 2006, the plant manager co-authored a report about the performance of the system, summarizing the environmental benefits that had been observed with its use ("High dust SCR solutions," Ulrich Leibacher, ELEX, Switzerland; Clemente Bellin, Cementeria di Monselice, Italy; AA Linero, PE, Tallahassee, Florida, International Cement Review, December 2006). Those benefits included the effect on VOC removal efficiencies:

> *"In addition, **75 % oxidation of VOC is recorded.** Almost all ozone precursors (NOX and VOC) can be eliminated from the stack emissions of Cementeria di Monselice with the installed SCR process."*

In a January 2014 interview for the publication Global Cement, Joseph Kitzweger, the plant manager of the LaFarge (now Holcim) cement plant in Mannersdorf, Austria using SCR commented that,

> *"When we installed the SCR we noticed that* ***it lowered our TOC emissions*** *as well as our SO_2. That was a nice bonus."*

ChemCat, a manufacturer of SCR units, concludes the technology **can achieve the same range of 80-90% removal on non-methane THCs as it can for Nitrogen Oxides** (http://elex-cemcat.com/faq/):

> *"SCR reduces NOx with ammonia to nitrogen and water by shifting the normal temperature level of the reaction from approx. 800-1100°C to 170 - 420°C. The active component, which is V_2O_5 has an oxidizing influence on VOCs, including ethane, SO_2, dioxins and furans and also elemental mercury.*
>
> ***...The other THCs (NMTHC) can be reduced by similar rates as NOx.*** *Dioxins and furans havethe same behavior, because they are chlorinated VOCs."*

SCR in other applications has shown aggressive THC removal efficiencies.

In 2006, the Manufacturers of Emission Controls Association (MECA) submitted a written statement to the U.S. EPA in October 2006 regarding newly proposed emission standards for internal combustion engines. In that statement, MECA reported the multi-pollutant benefits of SCR installations that were removing not only 90% plus of NOx, but also over 80% of carbon monoxide, and **over 70% of VOCs.**

In a 2008 paper on SCR tests in heavy duty diesel engines, ("Effects of a Zeolite-Selective Catalytic Reduction System on Comprehensive Emissions from a Heavy-Duty Diesel Engine" Z. Gerald Liu, Devin R. Berg, and James J. Schauer, ISSN:1047-3289, *Air & Waste Manage. Assoc.*, 2008) the authors **recorded an 86% THC removal rate.**

The most compelling evidence that SCR is economically and technically feasible for Holcim's compliance with the new National Emission Standards for Hazardous Air Pollutants for the Portland Cement Manufacturing Industry **is the fact that the company has included the technology as one of two options to be considered for that very purpose in its PSD permit application.**

On the other hand, **the status of RTOs as economically feasible, and therefore appropriate for removal of THCs at Holcim is completely dependent on the price of natural gas,** which is a variable hard to predict very far into the future. One only has to go down Highway 67 in Midlothian a few miles to the neighboring TXI cement plant to see an example of the fluctuating nature of RTO's reliability.

> *"A Regenerative Thermal Oxidizer (RTO) was installed on a nearby kiln.... However, as discussed in the permit information provided by TCEQ), after operating the RTO for a year, this facility found that* ***the operating costs were prohibitively expensive,*** *and requested that TCEQ modify the requirements.*

The requirements were eventually addressed by the State Office of Administrative Hearings for a contested case, and a settlement reached in July 15, 2005. Under the settlement, the facility continues to operate the RTO, ***but with an increase in CO****, a decrease in operating temperature sufficient to meaningfully reduce natural gas usage and electric consumption.*

In addition, ***a Best Available Control Technology analysis for Holcim*** *is included in Reference 2. Appendix F of this document contains cost information for RTO equipment at Holcim, and includes both capital cost and operating cost data. In September of 2005, TCEQ's estimate of the cost for the RTO was $9,376 per ton VOC; since then, increasing costs for the natural gas necessary to fuel the RTO have further reduced the cost effectiveness of the control device (costs for natural gas have increased more than 30% since the estimate was developed). Based on EPA's review of the technical and cost information provided by TCEQ, although operation of an RTO is technically possible,* ***the costs associated with an RTO are not considered to be economically feasible at this time."***
(Reasonably Available Control Technology (RACT) for VOC Controls for the Dallas - Fort Worth 8-Hour Ozone Nonattainment Area Technical Support Document Docket ID EPA-R06-OAR-2007-0524, June 2008)

While an argument can be made that the recent development of natural gas shale plays in Texas and elsewhere have made this issue moot, there are many factors that could drive gas prices back up to levels that would make the kind of RTO technology Holcim is considering prohibitively expensive once again in the near future.

Exporting of gas to other countries, rising demand for gas in power plants and vehicles, and new petrochemical plants relying on it as feedstock could all significantly increase prices for gas in the next five to 10 years, forcing Holcim to once again consider other options for THC removal.

For example, in April the U.S. Energy Information Administration estimated that the accelerating rate of coal plant retirements could cause natural gas prices to rise from $3.44 per million British thermal units (Btu) in 2012 to $5.91 per million Btu in 2025. **That's approximately the same price that made RTOs prohibitively expensive for Holcim to operate in 2005.**

In June, citing a slow refill of natural gas storage and increased switching to gas by generators, credit rating agency Moody's raised its natural gas price assumptions 13% for the rest of this year to $4.50/MMBtu. (Platts News Service, June 19, 2014). A recent Black & Veatch survey, ("2013 Strategic Directions in the North American Natural Gas Industry") concluded that natural gas prices would increase to a range between **$4.50 to $7.49 MMBtu in 2020**. A Charles River Associates study for Dow Chemical in February 2013 predicted gas exports could **raise the price of gas by 300% over then current levels** ("US Manufacturing and LNG Exports: Economic Contributions to the US Economy and Impacts on US Natural Gas Prices").

The unpredictability of the largest single cost in operating an RTO – an energy cost that could once again make operation "economically infeasible" - undermines its long-term reliability. Choosing SCR avoids this potential reliability problem while providing removal efficiencies for THC pollution that allows Holcim's Midlothian cement plant to comply with new NESHAP requirements.

III. Once THC Pollution is Reduced to Legal Levels, SCR is "BACT" for PM and CO compared to an RTO

A) Particulate Matter/Metals

In its permit application, Holcim estimates increases in Particulate Matter of 2.5 microns or less, Particulate Matter 10 microns or less, and Sulfuric Acid Mist as a result of its modification, although it doesn't estimate the amount of those increases. It concludes its existing wet scrubbers and "good combustion practices" are BACT for these increases.

But without knowing how much of an increase in these pollutants is expected, it's impossible to know if these existing controls are sufficient. It's precisely because of the unknown quantity of the PM pollution increases cited by Holcim that new PM control equipment should be required. We conclude that an SCR unit working in combination with existing equipment is actually BACT for addressing any increases in PM pollution while simultaneously pursuing a reduction in THC pollution.

SCR is known for its ability to reduce Particulate Matter. As noted in the EPA's Alternative Control Techniques document "SCR minimizes emissions of NH3, **a fine particulate matter precursor**..." It has the same effect on metals PM pollution.

> *"... SCR can oxidize Hg and make it more collectible in the dust control equipment. It is possible therefore to improve on the efficacy of Hg reduction by **dust withdrawal in conjunction with SCR**."* ("Comments on Draft Alternative Control Techniques Document Update – NOx Emissions from New Cement Kilns" *Al Linero, PE. Florida Department of Environmental Protection, June 2006)*

SCR in heavy-duty ship engines has been observed to obtain **25-40% reductions in Particulate Matter pollution** ("Clean North Sea Shipping, SCR," http://cleantech.cnss.no/air-pollutant-tech/nox/selective-catalytic-reduction-scr/)

In describing the effects of SCR on retrofitted heavy-duty diesel engines, EPA states "**SCR systems are commonly used in conjunction with a DOC and/or DPF to reduce PM emissions**" (http://www.epa.gov/cleandiesel/technologies/retrofits.htm).

The diesel industry reports **PM reductions of up 50% with SCR** (Diesel Technology Forum, http://www.dieselforum.org/files/dmfile/SelectiveCatalyticReduction.pdf).

According to one manufacturer of SCR, "In heavy-duty trucks, SCR will **reduce Particulate matter (PM) emissions by 30–50%"** (http://www.factsaboutscr.com/scr/engine-control-standards.aspx).

A diesel engine manufacturer also reports **PM reductions of 30-50 percent.** (http://www.dieselforum.org/files/dmfile/SelectiveCatalyticReduction.pdf).

Moreover, it appears that it's the operation of an RTO, not an SCR unit, that's responsible for the PM pollution increases that Holcim is estimating will take place as a result of its modification.

How can one tell this in the permit application (besides the long record of SCR units removing PM pollution from exhaust streams)? RTO's are not known for their ability to enhance PM removal rates. **In fact, PM pollution is a threat to their effectiveness,** a consideration that should be paramount in their installation in cement kiln operation. According to power plant industry sources,

> "Although oxidizer systems are used primarily for the abatement of VOCs, all emission streams contain some quantity of particulate matter, and these particles can lead to bed fouling, performance degradation and even to dangerous and destructive fires. (http://www.reliableplant.com/Read/19688/abate-vocs,-or-pollutants-with-rmal-oxidizers)

Dealing with this fact requires additional control measures that would be unnecessary for an SCR unit, as the request from Holcim makes clear. An RTO manufacturer states that:

> "Larger amounts (of PM) may require a wet scrubber, fabric filtration or electrostatic precipitation system prior to RTO process entrance. Large amounts of fine condensable particles in the process stream may require the use of preheating prior to entering the RTO." (http://rto.american-environmental.us/Optimum_Thermal_Oxidizer_Operation.html)

And indeed, that's exactly the kind of additional requirements that Holcim states will be necessary to run its unnamed "oxidation process" at is Midlothian plant, i.e. upgrades to existing baghouses and reheating of the flue gases.

In contrast, there are now "high," "low" and "medium" dust SCR applications for cement plants, all currently operating or being built in Europe. Likewise there are SCR units that work at temperatures as low as 250 C so that no, or little re-heating is needed.

So what's causing the new PM pollution increases that Holcim states will requires a PSD permit ? Operation of an RTO.

RTOs and SCR units are not equal in their ability to produce or remove PM pollution. RTOs produce more of it, SCR units less. Yet the Holcim permit application treats them the same.

If the goal is to reduce PM pollution as much as possible while better controlling for THCs, then there's no question that SCR is the superior technology. It offers supplemental PM reduction whereas the RTO offers none, doesn't require additional PM control measures, or much, if any, reheating, and isn't threatened by PM overload. SCR is BACT for Holcim in capturing new PM pollution while also reducing THC pollution.

B. Carbon Monoxide

In its permit request, Holcim states that it expects an increase of 25% in Carbon Monoxide (CO) pollution as a result of "the oxidation of the THC that is present in the kiln exhaust stream" as well as an increase in natural gas use, plus an almost 58,000 ton per year increase in CO2. Again the company states that wet scrubbers alone and "good combustion practices" will be sufficient to control these increases. We disagree.

Once again, more than likely these numbers are based on operation of an RTO, not an SCR unit.

SCR catalysts are now able to operate at temperatures as low as **250C/482 F** ((http://www.durrenvironmental.com/NOXCS.asp "NOx Emission Control: Emission Origins and Available Control Solutions"), whereas RTO's must operate at very high temperatures of **850C/15-1600F** (Holcim Permit Application, p 7). **There's inherently more demand for natural gas and more combustion involved in the operation of an RTO than SCR unit.** It takes less energy and less combustion to operate an SCR. It therefore produces less CO.

In October 2006, the Manufacturers of Emission Controls Association (MECA) submitted a written statement to the U.S. EPA regarding newly proposed emission standards for internal combustion engines. In that statement, MECA reported **one of the multi-pollutant benefits of SCR installations was a removal rate of over 80% of carbon monoxide.**

Diesel engine manufacturers have identified **CO reductions as large as 50-90% with use of SCR.** (http://www.dieselforum.org/files/dmfile/SelectiveCatalyticReduction.pdf).

SCR manufacturers have **reported the same 50-90% CO removal rates.** (http://www. factsaboutscr.com/scr/engine-control-standards.aspx)

In addition, **reliance on an SNCR unit like the one Holcim currently operates at its Midlothian cement plant can also cause CO and CO2 increases:**

> *".... the use of ammonia-solution based SNCR for NOx control will adversely affect the oxidation of CO to CO2 because both reactions will compete for OH*radicals required for reduction of CO and NOx. One study revealed that a molar ratio of NH3to NOx of 0.4 increased CO emissions by up to 0.5 pounds per ton of clinker. When such ratio increased to 0.8 and 1.0,* ***the CO emissions were increased by up to 1.0 and 1.5 pounds per ton of clinker respectively.****("*Prevention of Significant Air Quality Deterioration Review, Preliminary Determination" March, 2008 State of Georgia - Department of Natural Resources Environmental Protection Division - Air Protection Branch]

In this case, "good combustion practices" seem to translate to installation of SCR to prevent unnecessary CO and CO2 pollution increases, rather than doubling down on SNCR technology as Holcim is seeking permission to do in its permit application by insisting it can build a second SNCR unit for each kiln.

RTOs have higher temperatures and inherently need more combustion to work than an SCR unit, and the EPA states plainly that, ***"RTO systems do not reduce the levels of CO"*** (EPA-452/F-03-021 Air Pollution Control Technology Fact Sheet). Additionally, the above-cited TXI example shows **that RTOs can actually increase CO pollution over the status quo**, depending on how they're operated.

To prevent significant increases in CO pollution at Holcim's Midlothian cement plant while pursuing THC pollution reductions, SCR technology is BACT.

IV. Multi-Pollutant Benefits from SCR Outweigh Existing SNCR and Proposed RTO

A. Ammonia

Ammonia is a hazardous air pollutant and it can also transform in the atmosphere to ammonium-based fine particulate matter (PM), which has known adverse health effects and contributes to regional haze and visibility reduction.

Ammonia can be emitted in significant quantities in cement stack gases, originating from the combustion of coal in the cement kiln, as well as from the raw materials used to produce the cement.

At certain cement plants, like Holcim's, ammonia is intentionally sprayed into cement stack gases as the reducing agent for SNCR processes to control NOx emissions.

SNCR systems differ from SCR systems in that SNCR systems do not employ a catalyst to promote the reaction between ammonia and NOx. For this reason, SNCR systems are usually not as effective for NOx control as SCR systems, and **"emissions of unused ammonia in the stack gases (a.k.a ammonia slip) are usually higher for SNCR systems than SCR systems"** (*"Air Pollution Control A Design Approach," 3rd ed.* Waveland Press, 2002, C.D. Cooper and F. C. Alley, and "Trip Report on SCR Experiences at Solnhofer Portland Zementwerke, Cementeria di Monselice, and ASM Brescia Waste-to-Energy Plant." July 31, 2006 Al Linero 2006).

Data from the European SCR installations indicates that the SCR units are extremely effective at reducing ammonia emissions. The Solnhofer cement plant in Germany has reported that emissions of ammonia were greater than 20 mg/m3 with an SNCR system, but only 1 mg/m3 with the SCR system.

> *"The SCR installation has proven its multi-pollutant control capabilities. Beside the extremely high and efficient NOx removal capabilities, NH3 present in flue gas from raw material is completely used in the SCR process,* ***thus considerably lowering the aqueous ammonia consumption, the related operating cost, a fine particulate precursor and potential odorant"*** ("High dust SCR solutions." *International Cement Review,* December 2006. *U.* Leibacher).

The Monselice, Italy cement plant reported that ammonia emissions were 20-50 mg/m3 before installation of the SCR system, but only 1-6 mg/m3 after SCR installation.

Holcim already reports that it had to get "an alternate baseline for control of its ammonia slip" caused by their two existing SNCR units. Adding another SNCR unit at each kiln is likely to increase ammonia emissions. However, installation of an SCR unit working by itself or a hybrid SNCR-SCR unit could significantly reduce the ammonia pollution from Holcim. This is something that an RTO could not do.

B. Dioxins/Furans

Polychlorinated dibenzodioxins andpolychlorinated dibenzofurans, (Dioxins and Furans) are a special category of hydrocarbons and are classified as known human carcinogens by the EPA. Cement plants are significant dioxin and furan polluters. In a 2005 study published by Harvard University and University of California at Davis researchers, the cement industry ranked first out of420 industrial sectors analyzed in direct cancer risk per dollar of economic output. The high ranking of the cement industry was driven in large part the levels of dioxin and furans it emits.

Reports of the efficient destruction of dioxin and furans with SCR technology catalysts began as early as 1991, ("Dioxin Destruction in Catalysts for NOx Reduction (SCR-DeNOx)." *Chemosphere*, vol. 25, 1992." K.B. Carlsson) and have been recorded numerous times since then at facilities worldwide.

Greater than 99% destruction of dioxin and furans with an SCR catalyst was reported being achieved at a waste incinerator in the Netherlands ("The Shell System for NOx Removal and Dioxin Destruction from Incineration FlueGas – CRI Catalyst Company." 3rd International Symposium on Incineration and Flue Gas Treatment Technologies, Brussels, Belgium, July 2-4, 2001." O.L.Maaskant).

A 50 to 75% destruction of dioxins and furans was reported for an SCR catalyst at a metal smelting plant and **98% destruction with the SCR unit** at a waste incinerator ("Destruction of PCDD/Fs by SCR from flue gases of municipal waste incinerator and metal smelting plant," *Chemosphere*, 2007 Vol 66." M. B. Chang, K.H. Chi, S.H. Chang and J.W.Yeh) .

In a 2007 paper examining a wide variety of technologies to control dioxins and furans, the authors conclude that,

> ***"A method of selective catalytic reduction for the NOx gases can be also applied for the dioxins remediation.*** *The present evidence shows that the catalysts used in selective reduction of the NOx in the flue gas* ***suppressed the formation of dioxins by 85%*** *(Goemans et al., 2004). It proves that a single, effectively designed catalyst can be used in the removal of the oxides of nitrogen and dioxins (Liljelind et al., 2001)"*
> (Dioxins sources and current remediation technologies—A review"
> Prashant S. Kulkarni, João G. Crespo, and Carlos A.M. Afonso,
> Environment International, Vol 34, September, 2007)

RTO's are not even mentioned in the review.

In a November 2007 report, the U.S. EPA assessed NOx control technologies for cement kilns and stated that SCR units have the additional potential to decrease both VOC and dioxin and furan emissions, based on the recent SCR installations on cement kilns in Europe and also data collected in other industries (U.S. EPA. "Alternative Control Techniques Document Update – NOx Emissions from New Cement Kilns." EPA-453/R-07-006, November 2007.)

In describing the multi-pollutant advantages of SCR at the Monselice Italy cement plant over SNCR, Linero et al states that, *"In addition, 75 % oxidation of VOC was recorded and dioxin and furan were destroyed"* (High Dust SCR Succeeds at Cementeria di Monselice," Alvaro A. Linero Florida Department of Environmental Protection, Ulrich Leibacher ELEX AG, Schwerzenbach, Switzerland Clemente Bellin Cementeria di Monselice SPA, Monselice (Padova), Italia, December 2006).

Reporting at the 2nd Global Cement Conference on Environmental Technology for Cement & Lime taking place in London in March of this year, Franz-Josef Zurhove of the SCR Manufacturer Elex noted a 95% NO_x reduction is possible with the technology in a cement kiln along with ***"simultaneous VOC, dioxin and furans reduction and mercury oxidation."***

Another pollution control manufacturer, Götaverken Miljö of Sweden, reports that **SCR can *"reduce the concentration of dioxin to below 0.1ng TEQ/Nm"*** (http://www.gmab.se/documents/ENG_DioxinremovalbyADIOX_Typicalapplications_lq.pdf).

The ability for SCR to remove significant amounts of dioxins and furans from a kiln's waste stream makes it the better choice than an RTO for installation at the Holcim's Midlothian cement plant.

C. Nitrogen Oxides

Holcim states in its permit request that it expects an increase in NOx but it doesn't provide any quantification of that increase. Because of this unknown, it's impossible to determine whether the company will be successful in controlling that increase with "excess capacity" from its existing SNCR unit or by building a second SNCR unit "if required" as Holcim asserts.

The fact that the company can neither put a number on the NOx increase in its PSD permit application, or list a specific control strategy to address it in the same document underlines the great uncertainty of the entire application itself.

Besides engendering increased ammonia slip by maxing out its current SNCR capability or adding a second SNCR unit to each kin, CO and CO2 pollution will also probably increase by using SNCR technology for the capture of NOx instead of SCR.

And like the other pollution increases cited in the Holcim application, this predicted rise in NOx from "combustion" is most likely tied to the operation of an RTO, not an SCR unit.

Regardless, for control of NOx pollution, there is no better technology for cement kilns in the world today than SCR.

European cement plants using SCR report reductions **from 80 to over 90%.** The Solnhofer, Germany plant reported **an 80% removal rate** for NOx pollution when it operated its SCR unit in the early part of this century. The plant manager of the Monselice, Italy cement plant using SCR installed in 2006 has **recorded a 95% removal rate** of NOx pollution. The Mergelstetten, Germany cement plant **reports an 85% removal rate** for NOx pollution from an SCR unit installed in 2010. The Rohrdorf, Germany cement plant **reports an 88-90% reduction in NOx** pollution from an SCR unit installed in 2011. At the **Holcim-owned** Joppa, Illinois long dry kiln where an EPA pilot project is currently being conducted, operators report an **80% removal rate for a retrofitted SCR system.** ("Is SCR Technology Coming (back) to Cement?" John Kline, World Cement, April 2013)

All of these SCR removal rates exceed Holcim's current NOx removal rates using SNCR by over 50%.

If new equipment is going to have to be installed to better control an unknown amount of new NOx pollution it should be state-of-the-art NOx control technology and not a redundant second-best SNCR unit. Ellis County is part of the ten-county DFW nonattainment area for ozone, which is currently classified as "serious," with a "severe" designation pending. Midlothian cement plants, including Holcim, have been subject to specific rules limiting their production of ozone precursors. Any new emissions of NOx from Holcim should be avoided.

SCR should now be mandatory when the potential for new NOx emissions is present, as it is in this permit application, especially given that we have no idea what the size of those new NOx emissions are going to be. Holcim has a less than stellar track record in predicting how well its NOx control strategies will work at the Midlothian cement plant, having been completely wrong about the need for them in the recent past, forcing the installation of SNCR by settlement agreement. Citizens need assurances that new NOx pollution will be addressed by the best technology now available for its capture. That's SCR.

Besides the retrofitted Joppa, Illinois cement plant that's demonstrated the effectiveness of SCR technology, Holcim also has the experience of its cement plant in Mannersdorf, Germany that combines SCR with an RTO and, according to a recent interview with the plant manager

> "...is capable of reducing Total Hydrocarbons by around 98 - 99%,
> while also cutting smog-forming Nitrogen Oxides by around 90%."
> The Mannerdorf SCR-RTO system is also capable of running in autothermal
> or "self-fuelling" mode, saving substantial amounts on energy costs.
> During the first year, the overall operating costs of he SCR in Mannersdorf
> were comparable to those of an SNCR." ("Global Cement," March 2014)

Besides combining SCR with an RTO to get maximum pollution reductions of a variety of pollutants, there is also the option of adding smaller SCR units to run in conjunction with the existing SNCR technology at the Holcim Midlothian plant, to produce so-called "hybrid systems."

According to University of Texas at Arlington researchers who studied SCR-SNCR hybrids ("Hybrid Systems" January 2011, unpublished) the benefits of such an arrangement include:

- higher NOx removal compared to SNCR alone (and often SCR alone, as well)
- lower NH_3 slip compared to SNCR alone (improved efficiency of chemical utilization),
- downsized SCR catalyst bed, which means lower operation and maintenance costs compared to SCR alone, and easier retrofit,
- potential elimination of the SCR ammonia injection system,
- reduced SO_2 oxidation, which lessens risks associated with both ammonium bisulfate formation and plume opacity associate with SO_3.

Manufacturers of SCR agree with this assessment:

> "A recent progression in system design is the Hybrid SNCR/SCR system approach. By combining the two technologies, improvements can be seen in chemical and catalyst utilization, making the hybrid combination often more flexible and effective than the sum of its parts. A Hybrid system utilizes lower temperature SCNR injection to provide improved NOx reduction while generating higher ammonia slip. The residual ammonia slip is the reagent for a smaller SCR reactor that removes the slip and reduces NOx while limiting the costs associated with a larger catalyst volume." (http://www.durrenvironmental.com/NOXCS.asp "NOx Emission Control: Emission Origins and Available Control Solutions")

As does the EPA:

"....the (EPA)notes that hybrid combinations of SNCR and SCR could be used in new cement kilns to achieve greater reductions than would be possible with SNCR alone."
National Association of Clean Air Agencies, "COMMENT ON PORTLAND CEMENT NSPS 2009"

No matter what the pollutant increase cited in Holcim's permit application, SCR is the best technology to address its reduction and control. To sanction the installation of anything less the best option would be to invite unnecessary pollution problems in a location where there have been far too many already.

We support the installation of SCR at Holcim and we urge the company to submit an application that specifically calls for that option as a substitute for this "placeholder" permit application. On its merits, we urge the TCEQ to reject the current application as being too general, with too many unknowns, and without sufficient assurances that estimated pollution increases will be adequately controlled.

Submitted by
Downwinders at Risk Education Fund
Grace Darling, Chair
Jim Schermbeck, Director
PO Box 763844
Dallas, TX 75376
972-230-3185

A hard copy of these comments is being mailed to the Chief Clerk's office.

Comments on:
The Amendment to State Air Quality Permit Number 8996,
Modification to Prevention of Significant Deterioration Air Quality
Permit Number PSDTX454M4

NSR 92407

Submitted by Downwinders at Risk
July 11th, 2014
to the
Texas Commission on Environmental Quality
Office of the Chief Clerk
MC 105, P.O. box 13087
Austin, Texas 78711-3087

Downwinders at Risk is a 20-year old organization with a long history of regulatory involvement with the facility that's the subject of this permit application.

We represent local Midlothian residents such as rancher Sue Pope, who are directly affected by the pollution from Holcim's Midlothian cement plant because they live immediately adjacent to the plant's property, as Ms. Pope does (9/10's of a mile north at 476 Hidden Valley Trail Midlothian, Texas, 75104), or in close proximity of it (within one to two miles), and whose health and well-being have been, and continue to be, threatened by its routine operation.

We also represent residents who live in Cedar Hill, DeSoto, Duncanville, Arlington, Grand Prairie, Mansfield, Fort Worth, Dallas, and other communities whose health is directly affected by the voluminous pollution from Holcim's Midlothian cement plant because of the predominant wind direction as documented by TCEQ in numerous regulatory filings and findings. Our decades of official regulatory involvement with Holcim's operations are well established in the public record, as is Ms. Pope's eligibility for legal standing in matters regarding Holcim's operations governed by state and federal statutes.

We note for the record that, contrary to Title 30, Chapter 39, Subchapter H, Rule §39.405 of the Texas Administrative Code relating to Applicability and General Provisions of Public Notice, the permit applicant did not make "a copy of the application available for review and copying at a public place in the county in which the facility is located or proposed to be located on the first day of newspaper publication or any day thereafter. "

Although the official published public notice asserted a copy of the referenced permit application was available to the public at the A. H. Meadows Public Library, 922 South 9th Street in Midlothian, no such copy was present for the duration of the commenting period when members of Downwinders at Risk repeatedly requested it. Nor, as the official published notice also asserted, was a copy of the referenced permit application available at the TCEQ Region 4 office in Fort Worth when Downwinders at Risk members sought it out at that location. For these reasons we request the referenced permit application be found automatically administratively incomplete by TCEQ, and a new public notice and commenting period begun before consideration of the Holcim permit application on its merits by the Commission.

Should TCEQ proceed with a consideration of the referenced permit application that did not fulfill the legally binding public notice requirements as established by the Texas Administrative Code, we reserve the right to challenge the results of that consideration in court.

Per Texas Administrative Code RULE §39.602, as persons who are filing public comment or hearing requests on or before the deadline for filing public comment or hearing requests, Downwinders at Risk requests to be mailed any correspondence related to the referenced permit application from this day forward at the address listed below.

Downwinders at Risk is encouraged by Holcim's consideration of Selective Catalytic Reduction (SCR) technology as an economically and technologically feasible option for the control of Total Hydrocarbons.

Because of its demonstrated superior ability to also remove significant amounts of Particulate Matter, Carbon Monoxide, Ammonia, Dioxin/Furans, and Nitrogen Oxide pollution more effectively than either a new RTO or the Selective Non-Catalytic Reduction (SNCR) unit Holcim currently operates, Downwinders at Risk advocates the Texas Commission on Environmental Quality eventually approve a Holcim permit application request that specifically calls for the installation of an SCR unit at its Midlothian cement plant.

However, in its current form, Holcim's permit application is an unknown quantity that should not be approved. It allows the company to chose a specific control technology for THC removal only *after* the granting of the permit itself by TCEQ - a backwards and legally-questionable process that gives Holcim a blank check before the public can weigh the detailed pros and cons of its choice and provide meaningful comment.

Holcim is a Major Source of air pollution. This request is a Major Modification to its permit. Instead of allowing Holcim a cafeteria-style, post facto approach to the selection of what that Major Modification will entail, TCEQ should reject this permit application and require the company to choose a specific pollution control system, with detailed specifications, and specific estimates of pollution totals.

Because of the number of unknowns contained in the current version of the Holcim permit application, and the potential for increases in pollution from the facility, **we request a contested case hearing on this permit application as well as a public meeting on behalf of our members such as Sue Pope, and all our members who live adjacent to, in close proximity of, or immediately downwind of Holcim's Midlothian cement plant who are adversely affected by the pollution Holcim would or could release as a result of the referenced permit application to its current permit in a way not common to the general public.**

These members include populations of elderly residents like Ms. Pope, as well as children living adjacent to, or in close proximity of, or immediately downwind of Holcim's Midlothian cement plant whose health is more sensitive than the population as a whole to increased exposure to Particulate Matter, Sulfuric Acid, Nitrogen Oxide, and Carbon Monoxide pollution identified by the company as the consequence of granting its permit application request.

They also include members living adjacent to, or in close proximity of, or immediately downwind of Holcim's Midlothian cement plant, again like Ms. Pope, with pre-existing respiratory problems and illness, such as asthmatics, and those with compromised immune systems, whose health is more sensitive than the general public, and might be further impaired as a result of exposure to the increases in routine pollution identified by the company as the consequence of granting its permit application request.

I. Holcim's Permit Application Assumes RTO and SCR Technologies Have the Same Pollution Impacts Requiring the Same PSD Reviews

Despite the inclusion of SCR as an option in the permit application, **the increases in Particulate Matter, Sulfuric Acid and Carbon Monoxide pollution cited by Holcim as triggering a PSD review and permit seem to be completely predicated on the operation of a Regenerative Thermal Oxidizer.** In other words, the increases in pollution generated by the operation of an RTO are driving Holcim's PSD permit application that includes consideration of both an RTO and an SCR unit.

That being the case, **true BACT for the Holcim plant would be exclusion of RTO technology in favor of a technology that doesn't trigger those increases, or at least doesn't trigger as much of an increase in each category of pollution.** That technology is SCR.

Holcim must prove in its permit application that that both SCR and RTO technology will result in equally large Sulfuric Acid Mist, PM, NOx and CO pollution increases. It doesn't do this. Nowhere in the permit application is there a side-by side comparison of the specific emissions expected from the operations of an RTO versus an SCR unit. Holcim only assumes that any generic "oxidation process" will result in the exact same increases in pollution. But the operating record of both technologies belies this assumption. Decades of facts on the ground show there is a great deal of difference in the ability of RTOs to generate and control sulfuric Acid Mist, PM, NOx, and CO pollution versus SCR units, both in and outside of the cement industry.

In addition, TCEQ's examination of the two options Holcim has identified in its "a la carte" PSD permit application for better control of Total Hydrocarbons cannot be limited to only the THC removal efficiencies of the control technologies under consideration. It must also consider the co-benefits resulting from each. Multi-pollutant control strategies are preferable to single-purpose ones. These differences are also what make SCR the superior and necessary regulatory choice in this instance.

II. SCR Technology Achieves THC Compliance for Holcim Without Inherent Uncertainties

SCR units installed in European Cement plants are demonstrating the THC/VOC destruction efficiency of SCR is more than sufficient to address the Holcim problem with organics in its mined limestone.

The Cementeria di Monselice cement plant in Padova Province, Italy, has been operating an SCR system for almost ten years. In December 2006, the plant manager co-authored a report about the performance of the system, summarizing the environmental benefits that had been observed with its use ("High dust SCR solutions," Ulrich Leibacher, ELEX, Switzerland; Clemente Bellin, Cementeria di Monselice, Italy; AA Linero, PE, Tallahassee, Florida, International Cement Review, December 2006). Those benefits included the effect on VOC removal efficiencies:

> *"In addition, **75 % oxidation of VOC is recorded.** Almost all ozone precursors (NOX and VOC) can be eliminated from the stack emissions of Cementeria di Monselice with the installed SCR process."*

In a January 2014 interview for the publication Global Cement, Joseph Kitzweger, the plant manager of the LaFarge (now Holcim) cement plant in Mannersdorf, Austria using SCR commented that,

> *"When we installed the SCR we noticed that* ***it lowered our TOC emissions*** *as well as our SO_2. That was a nice bonus."*

ChemCat, a manufacturer of SCR units, concludes the technology **can achieve the same range of 80-90% removal on non-methane THCs as it can for Nitrogen Oxides** (http://elex-cemcat.com/faq/):

> *"SCR reduces NOx with ammonia to nitrogen and water by shifting the normal temperature level of the reaction from approx. 800-1100°C to 170 - 420°C. The active component, which is V_2O_5 has an oxidizing influence on VOCs, including ethane, SO_2, dioxins and furans and also elemental mercury.*
>
> ***...The other THCs (NMTHC) can be reduced by similar rates as NOx.*** *Dioxins and furans havethe same behavior, because they are chlorinated VOCs."*

SCR in other applications has shown aggressive THC removal efficiencies.

In 2006, the Manufacturers of Emission Controls Association (MECA) submitted a written statement to the U.S. EPA in October 2006 regarding newly proposed emission standards for internal combustion engines. In that statement, MECA reported the multi-pollutant benefits of SCR installations that were removing not only 90% plus of NOx, but also over 80% of carbon monoxide, and **over 70% of VOCs.**

In a 2008 paper on SCR tests in heavy duty diesel engines, ("Effects of a Zeolite-Selective Catalytic Reduction System on Comprehensive Emissions from a Heavy-Duty Diesel Engine" Z. Gerald Liu, Devin R. Berg, and James J. Schauer, ISSN:1047-3289, *Air & Waste Manage. Assoc.*, 2008) the authors **recorded an 86% THC removal rate.**

The most compelling evidence that SCR is economically and technically feasible for Holcim's compliance with the new National Emission Standards for Hazardous Air Pollutants for the Portland Cement Manufacturing Industry **is the fact that the company has included the technology as one of two options to be considered for that very purpose in its PSD permit application.**

On the other hand, **the status of RTOs as economically feasible, and therefore appropriate for removal of THCs at Holcim is completely dependent on the price of natural gas,** which is a variable hard to predict very far into the future. One only has to go down Highway 67 in Midlothian a few miles to the neighboring TXI cement plant to see an example of the fluctuating nature of RTO's reliability.

> *"A Regenerative Thermal Oxidizer (RTO) was installed on a nearby kiln.... However, as discussed in the permit information provided by TCEQ), after operating the RTO for a year, this facility found that* ***the operating costs were prohibitively expensive,*** *and requested that TCEQ modify the requirements.*

The requirements were eventually addressed by the State Office of Administrative Hearings for a contested case, and a settlement reached in July 15, 2005. Under the settlement, the facility continues to operate the RTO, ***but with an increase in CO,*** *a decrease in operating temperature sufficient to meaningfully reduce natural gas usage and electric consumption.*

In addition, ***a Best Available Control Technology analysis for Holcim*** *is included in Reference 2. Appendix F of this document contains cost information for RTO equipment at Holcim, and includes both capital cost and operating cost data. In September of 2005, TCEQ's estimate of the cost for the RTO was $9,376 per ton VOC; since then, increasing costs for the natural gas necessary to fuel the RTO have further reduced the cost effectiveness of the control device (costs for natural gas have increased more than 30% since the estimate was developed). Based on EPA's review of the technical and cost information provided by TCEQ, although operation of an RTO is technically possible,* ***the costs associated with an RTO are not considered to be economically feasible at this time."***
(Reasonably Available Control Technology (RACT) for VOC Controls for the Dallas - Fort Worth 8-Hour Ozone Nonattainment Area Technical Support Document Docket ID EPA-R06-OAR-2007-0524, June 2008)

While an argument can be made that the recent development of natural gas shale plays in Texas and elsewhere have made this issue moot, there are many factors that could drive gas prices back up to levels that would make the kind of RTO technology Holcim is considering prohibitively expensive once again in the near future.

Exporting of gas to other countries, rising demand for gas in power plants and vehicles, and new petrochemical plants relying on it as feedstock could all significantly increase prices for gas in the next five to 10 years, forcing Holcim to once again consider other options for THC removal.

For example, in April the U.S. Energy Information Administration estimated that the accelerating rate of coal plant retirements could cause natural gas prices to rise from $3.44 per million British thermal units (Btu) in 2012 to $5.91 per million Btu in 2025. **That's approximately the same price that made RTOs prohibitively expensive for Holcim to operate in 2005.**

In June, citing a slow refill of natural gas storage and increased switching to gas by generators, credit rating agency Moody's raised its natural gas price assumptions 13% for the rest of this year to $4.50/MMBtu. (Platts News Service, June 19, 2014). A recent Black & Veatch survey, ("2013 Strategic Directions in the North American Natural Gas Industry") concluded that natural gas prices would increase to a range between **$4.50 to $7.49 MMBtu in 2020.** A Charles River Associates study for Dow Chemical in February 2013 predicted gas exports could **raise the price of gas by 300% over then current levels** ("US Manufacturing and LNG Exports: Economic Contributions to the US Economy and Impacts on US Natural Gas Prices").

The unpredictability of the largest single cost in operating an RTO – an energy cost that could once again make operation "economically infeasible" - undermines its long-term reliability. Choosing SCR avoids this potential reliability problem while providing removal efficiencies for THC pollution that allows Holcim's Midlothian cement plant to comply with new NESHAP requirements.

III. Once THC Pollution is Reduced to Legal Levels, SCR is "BACT" for PM and CO compared to an RTO

A) Particulate Matter/Metals

In its permit application, Holcim estimates increases in Particulate Matter of 2.5 microns or less, Particulate Matter 10 microns or less, and Sulfuric Acid Mist as a result of its modification, although it doesn't estimate the amount of those increases. It concludes its existing wet scrubbers and "good combustion practices" are BACT for these increases.

But without knowing how much of an increase in these pollutants is expected, it's impossible to know if these existing controls are sufficient. It's precisely because of the unknown quantity of the PM pollution increases cited by Holcim that new PM control equipment should be required. We conclude that an SCR unit working in combination with existing equipment is actually BACT for addressing any increases in PM pollution while simultaneously pursuing a reduction in THC pollution.

SCR is known for its ability to reduce Particulate Matter. As noted in the EPA's Alternative Control Techniques document "SCR minimizes emissions of NH3, **a fine particulate matter precursor**..." It has the same effect on metals PM pollution.

> *"... SCR can oxidize Hg and make it more collectible in the dust control equipment. It is possible therefore to improve on the efficacy of Hg reduction by **dust withdrawal in conjunction with SCR.**"* ("Comments on Draft Alternative Control Techniques Document Update – NOx Emissions from New Cement Kilns" *Al Linero, PE. Florida Department of Environmental Protection, June 2006)*

SCR in heavy-duty ship engines has been observed to obtain **25-40% reductions in Particulate Matter pollution** ("Clean North Sea Shipping, SCR," http://cleantech.cnss.no/air-pollutant-tech/nox/selective-catalytic-reduction-scr/)

In describing the effects of SCR on retrofitted heavy-duty diesel engines, EPA states "**SCR systems are commonly used in conjunction with a DOC and/or DPF to reduce PM emissions**" (http://www.epa.gov/cleandiesel/technologies/retrofits.htm).

The diesel industry reports **PM reductions of up 50% with SCR** (Diesel Technology Forum, http://www.dieselforum.org/files/dmfile/SelectiveCatalyticReduction.pdf).

According to one manufacturer of SCR, "In heavy-duty trucks, SCR will **reduce Particulate matter (PM) emissions by 30–50%**" (http://www.factsaboutscr.com/scr/engine-control-standards.aspx).

A diesel engine manufacturer also reports **PM reductions of 30-50 percent.** (http://www.dieselforum.org/files/dmfile/SelectiveCatalyticReduction.pdf).

Moreover, it appears that it's the operation of an RTO, not an SCR unit, that's responsible for the PM pollution increases that Holcim is estimating will take place as a result of its modification.

How can one tell this in the permit application (besides the long record of SCR units removing PM pollution from exhaust streams)? RTO's are not known for their ability to enhance PM removal rates. **In fact, PM pollution is a threat to their effectiveness,** a consideration that should be paramount in their installation in cement kiln operation. According to power plant industry sources,

> "Although oxidizer systems are used primarily for the abatement of VOCs, all emission streams contain some quantity of particulate matter, and these particles can lead to bed fouling, performance degradation and even to dangerous and destructive fires. (http://www.reliableplant.com/Read/19688/abate-vocs,-or-pollutants-with-rmal-oxidizers)

Dealing with this fact requires additional control measures that would be unnecessary for an SCR unit, as the request from Holcim makes clear. An RTO manufacturer states that:

> "Larger amounts (of PM) may require a wet scrubber, fabric filtration or electrostatic precipitation system prior to RTO process entrance. Large amounts of fine condensable particles in the process stream may require the use of preheating prior to entering the RTO." (http://rto.american-environmental.us/Optimum_Thermal_Oxidizer_Operation.html)

And indeed, that's exactly the kind of additional requirements that Holcim states will be necessary to run its unnamed "oxidation process" at is Midlothian plant, i.e. upgrades to existing baghouses and reheating of the flue gases.

In contrast, there are now "high," "low" and "medium" dust SCR applications for cement plants, all currently operating or being built in Europe. Likewise there are SCR units that work at temperatures as low as 250 C so that no, or little re-heating is needed.

So what's causing the new PM pollution increases that Holcim states will requires a PSD permit ? Operation of an RTO.

RTOs and SCR units are not equal in their ability to produce or remove PM pollution. RTOs produce more of it, SCR units less. Yet the Holcim permit application treats them the same.

If the goal is to reduce PM pollution as much as possible while better controlling for THCs, then there's no question that SCR is the superior technology. It offers supplemental PM reduction whereas the RTO offers none, doesn't require additional PM control measures, or much, if any, reheating, and isn't threatened by PM overload. SCR is BACT for Holcim in capturing new PM pollution while also reducing THC pollution.

B. Carbon Monoxide

In its permit request, Holcim states that it expects an increase of 25% in Carbon Monoxide (CO) pollution as a result of "the oxidation of the THC that is present in the kiln exhaust stream" as well as an increase in natural gas use, plus an almost 58,000 ton per year increase in CO2. Again the company states that wet scrubbers alone and "good combustion practices" will be sufficient to control these increases. We disagree.

Once again, more than likely these numbers are based on operation of an RTO, not an SCR unit.

SCR catalysts are now able to operate at temperatures as low as **250C/482 F** ((http://www.durrenvironmental.com/NOXCS.asp "NOx Emission Control: Emission Origins and Available Control Solutions"), whereas RTO's must operate at very high temperatures of **850C/15-1600F** (Holcim Permit Application, p 7). **There's inherently more demand for natural gas and more combustion involved in the operation of an RTO than SCR unit.** It takes less energy and less combustion to operate an SCR. It therefore produces less CO.

In October 2006, the Manufacturers of Emission Controls Association (MECA) submitted a written statement to the U.S. EPA regarding newly proposed emission standards for internal combustion engines. In that statement, MECA reported **one of the multi-pollutant benefits of SCR installations was a removal rate of over 80% of carbon monoxide.**

Diesel engine manufacturers have identified **CO reductions as large as 50-90% with use of SCR.** (http://www.dieselforum.org/files/dmfile/SelectiveCatalyticReduction.pdf).

SCR manufacturers have **reported the same 50-90% CO removal rates.** (http://www. factsaboutscr.com/scr/engine-control-standards.aspx)

In addition, **reliance on an SNCR unit like the one Holcim currently operates at its Midlothian cement plant can also cause CO and CO2 increases:**

> *"... the use of ammonia-solution based SNCR for NOx control will adversely affect the oxidation of CO to CO2 because both reactions will compete for OH*radicals required for reduction of CO and NOx. One study revealed that a molar ratio of NH3to NOx of 0.4 increased CO emissions by up to 0.5 pounds per ton of clinker. When such ratio increased to 0.8 and 1.0,* ***the CO emissions were increased by up to 1.0 and 1.5 pounds per ton of clinker respectively.*** ("Prevention of Significant Air Quality Deterioration Review, Preliminary Determination" March, 2008 State of Georgia - Department of Natural Resources Environmental Protection Division - Air Protection Branch)

In this case, "good combustion practices" seem to translate to installation of SCR to prevent unnecessary CO and CO2 pollution increases, rather than doubling down on SNCR technology as Holcim is seeking permission to do in its permit application by insisting it can build a second SNCR unit for each kiln.

RTOs have higher temperatures and inherently need more combustion to work than an SCR unit, and the EPA states plainly that, ***"RTO systems do not reduce the levels of CO"*** (EPA-452/F-03-021 Air Pollution Control Technology Fact Sheet). Additionally, the above-cited TXI example shows **that RTOs can actually increase CO pollution over the status quo**, depending on how they're operated.

To prevent significant increases in CO pollution at Holcim's Midlothian cement plant while pursuing THC pollution reductions, SCR technology is BACT.

IV. Multi-Pollutant Benefits from SCR Outweigh Existing SNCR and Proposed RTO

A. Ammonia

Ammonia is a hazardous air pollutant and it can also transform in the atmosphere to ammonium-based fine particulate matter (PM), which has known adverse health effects and contributes to regional haze and visibility reduction.

Ammonia can be emitted in significant quantities in cement stack gases, originating from the combustion of coal in the cement kiln, as well as from the raw materials used to produce the cement.

At certain cement plants, like Holcim's, ammonia is intentionally sprayed into cement stack gases as the reducing agent for SNCR processes to control NOx emissions.

SNCR systems differ from SCR systems in that SNCR systems do not employ a catalyst to promote the reaction between ammonia and NOx. For this reason, SNCR systems are usually not as effective for NOx control as SCR systems, and **"emissions of unused ammonia in the stack gases (a.k.a ammonia slip) are usually higher for SNCR systems than SCR systems"** (*"Air Pollution Control A Design Approach," 3rd ed.* Waveland Press, 2002, C.D. Cooper and F. C. Alley, and "Trip Report on SCR Experiences at Solnhofer Portland Zementwerke, Cementeria di Monselice, and ASM Brescia Waste-to-Energy Plant." July 31, 2006 Al Linero 2006).

Data from the European SCR installations indicates that the SCR units are extremely effective at reducing ammonia emissions. The Solnhofer cement plant in Germany has reported that emissions of ammonia were greater than 20 mg/m3 with an SNCR system, but only 1 mg/m3 with the SCR system.

> *"The SCR installation has proven its multi-pollutant control capabilities. Beside the extremely high and efficient NOx removal capabilities, NH3 present in flue gas from raw material is completely used in the SCR process,* ***thus considerably lowering the aqueous ammonia consumption, the related operating cost, a fine particulate precursor and potential odorant"*** ("High dust SCR solutions." *International Cement Review,* December 2006. *U.* Leibacher).

The Monselice, Italy cement plant reported that ammonia emissions were 20-50 mg/m3 before installation of the SCR system, but only 1-6 mg/m3 after SCR installation.

Holcim already reports that it had to get "an alternate baseline for control of its ammonia slip" caused by their two existing SNCR units. Adding another SNCR unit at each kiln is likely to increase ammonia emissions. However, installation of an SCR unit working by itself or a hybrid SNCR-SCR unit could significantly reduce the ammonia pollution from Holcim. This is something that an RTO could not do.

B. Dioxins/Furans

Polychlorinated dibenzodioxins andpolychlorinated dibenzofurans, (Dioxins and Furans) are a special category of hydrocarbons and are classified as known human carcinogens by the EPA. Cement plants are significant dioxin and furan polluters. In a 2005 study published by Harvard University and University of California at Davis researchers, the cement industry ranked first out of420 industrial sectors analyzed in direct cancer risk per dollar of economic output. The high ranking of the cement industry was driven in large part the levels of dioxin and furans it emits.

Reports of the efficient destruction of dioxin and furans with SCR technology catalysts began as early as 1991, ("Dioxin Destruction in Catalysts for NOx Reduction (SCR-DeNOx)." *Chemosphere*, vol. 25, 1992." K.B. Carlsson) and have been recorded numerous times since then at facilities worldwide.

Greater than 99% destruction of dioxin and furans with an SCR catalyst was reported being achieved at a waste incinerator in the Netherlands ("The Shell System for NOx Removal and Dioxin Destruction from Incineration FlueGas – CRI Catalyst Company." 3rd International Symposium on Incineration and Flue Gas Treatment Technologies, Brussels, Belgium, July 2-4, 2001." O.L.Maaskant).

A 50 to 75% destruction of dioxins and furans was reported for an SCR catalyst at a metal smelting plant and **98% destruction with the SCR unit** at a waste incinerator ("Destruction of PCDD/Fs by SCR from flue gases of municipal waste incinerator and metal smelting plant," *Chemosphere*, 2007 Vol 66." M. B. Chang, K.H. Chi, S.H. Chang and J.W.Yeh) .

In a 2007 paper examining a wide variety of technologies to control dioxins and furans, the authors conclude that,

> ***"A method of selective catalytic reduction for the NOx gases can be also applied for the dioxins remediation.*** *The present evidence shows that the catalysts used in selective reduction of the NOx in the flue gas* ***suppressed the formation of dioxins by 85%*** *(Goemans et al., 2004). It proves that a single, effectively designed catalyst can be used in the removal of the oxides of nitrogen and dioxins (Liljelind et al., 2001)"*
> (Dioxins sources and current remediation technologies—A review"
> Prashant S. Kulkarni, João G. Crespo, and Carlos A.M. Afonso,
> Environment International, Vol 34, September, 2007)

RTO's are not even mentioned in the review.

In a November 2007 report, the U.S. EPA assessed NOx control technologies for cement kilns and stated that SCR units have the additional potential to decrease both VOC and dioxin and furan emissions, based on the recent SCR installations on cement kilns in Europe and also data collected in other industries (U.S. EPA. "Alternative Control Techniques Document Update – NOx Emissions from New Cement Kilns." EPA-453/R-07-006, November 2007.)

In describing the multi-pollutant advantages of SCR at the Monselice Italy cement plant over SNCR, Linero et al states that, *"In addition, 75 % oxidation of VOC was recorded and dioxin and furan were destroyed"* (High Dust SCR Succeeds at Cementeria di Monselice," Alvaro A. Linero Florida Department of Environmental Protection, Ulrich Leibacher ELEX AG, Schwerzenbach, Switzerland Clemente Bellin Cementeria di Monselice SPA, Monselice (Padova), Italia, December 2006).

Reporting at the 2nd Global Cement Conference on Environmental Technology for Cement & Lime taking place in London in March of this year, Franz-Josef Zurhove of the SCR Manufacturer Elex noted a 95% NO_x reduction is possible with the technology in a cement kiln along with ***"simultaneous VOC, dioxin and furans reduction and mercury oxidation."***

Another pollution control manufacturer, Götaverken Miljö of Sweden, reports that **SCR can *"reduce the concentration of dioxin to below 0.1ng TEQ/Nm"*** (http:// www.gmab.se/documents/ENG_DioxinremovalbyADIOX_Typicalapplications_lq.pdf).

The ability for SCR to remove significant amounts of dioxins and furans from a kiln's waste stream makes it the better choice than an RTO for installation at the Holcim's Midlothian cement plant.

C. Nitrogen Oxides

Holcim states in its permit request that it expects an increase in NOx but it doesn't provide any quantification of that increase. Because of this unknown, it's impossible to determine whether the company will be successful in controlling that increase with "excess capacity" from its existing SNCR unit or by building a second SNCR unit "if required" as Holcim asserts.

The fact that the company can neither put a number on the NOx increase in its PSD permit application, or list a specific control strategy to address it in the same document underlines the great uncertainty of the entire application itself.

Besides engendering increased ammonia slip by maxing out its current SNCR capability or adding a second SNCR unit to each kin, CO and CO2 pollution will also probably increase by using SNCR technology for the capture of NOx instead of SCR.

And like the other pollution increases cited in the Holcim application, this predicted rise in NOx from "combustion" is most likely tied to the operation of an RTO, not an SCR unit.

Regardless, for control of NOx pollution, there is no better technology for cement kilns in the world today than SCR.

European cement plants using SCR report reductions **from 80 to over 90%.** The Solnhofer, Germany plant reported **an 80% removal rate** for NOx pollution when it operated its SCR unit in the early part of this century. The plant manager of the Monselice, Italy cement plant using SCR installed in 2006 has **recorded a 95% removal rate** of NOx pollution. The Mergelstetten, Germany cement plant **reports an 85% removal rate** for NOx pollution from an SCR unit installed in 2010. The Rohrdorf, Germany cement plant **reports an 88-90% reduction in NOx** pollution from an SCR unit installed in 2011. At the **Holcim-owned** Joppa, Illinois long dry kiln where an EPA pilot project is currently being conducted, operators report an **80% removal rate for a retrofitted SCR system.** ("Is SCR Technology Coming (back) to Cement?" John Kline, World Cement, April 2013)

All of these SCR removal rates exceed Holcim's current NOx removal rates using SNCR by over 50%.

If new equipment is going to have to be installed to better control an unknown amount of new NOx pollution it should be state-of-the-art NOx control technology and not a redundant second-best SNCR unit. Ellis County is part of the ten-county DFW nonattainment area for ozone, which is currently classified as "serious," with a "severe" designation pending. Midlothian cement plants, including Holcim, have been subject to specific rules limiting their production of ozone precursors. Any new emissions of NOx from Holcim should be avoided.

SCR should now be mandatory when the potential for new NOx emissions is present, as it is in this permit application, especially given that we have no idea what the size of those new NOx emissions are going to be. Holcim has a less than stellar track record in predicting how well its NOx control strategies will work at the Midlothian cement plant, having been completely wrong about the need for them in the recent past, forcing the installation of SNCR by settlement agreement. Citizens need assurances that new NOx pollution will be addressed by the best technology now available for its capture. That's SCR.

Besides the retrofitted Joppa, Illinois cement plant that's demonstrated the effectiveness of SCR technology, Holcim also has the experience of its cement plant in Mannersdorf, Germany that combines SCR with an RTO and, according to a recent interview with the plant manager

> "...is capable of reducing Total Hydrocarbons by around 98 - 99%,
> while also cutting smog-forming Nitrogen Oxides by around 90%."
> The Mannerdorf SCR-RTO system is also capable of running in autothermal
> or "self-fuelling" mode, saving substantial amounts on energy costs.
> During the first year, the overall operating costs of he SCR in Mannersdorf
> were comparable to those of an SNCR." ("Global Cement," March 2014)

Besides combining SCR with an RTO to get maximum pollution reductions of a variety of pollutants, there is also the option of adding smaller SCR units to run in conjunction with the existing SNCR technology at the Holcim Midlothian plant, to produce so-called "hybrid systems."

According to University of Texas at Arlington researchers who studied SCR-SNCR hybrids ("Hybrid Systems" January 2011, unpublished) the benefits of such an arrangement include:

- higher NOx removal compared to SNCR alone (and often SCR alone, as well)
- lower NH_3 slip compared to SNCR alone (improved efficiency of chemical utilization),
- downsized SCR catalyst bed, which means lower operation and maintenance costs compared to SCR alone, and easier retrofit,
- potential elimination of the SCR ammonia injection system,
- reduced SO_2 oxidation, which lessens risks associated with both ammonium bisulfate formation and plume opacity associate with SO_3.

Manufacturers of SCR agree with this assessment:

> "A recent progression in system design is the Hybrid SNCR/SCR system approach. By combining the two technologies, improvements can be seen in chemical and catalyst utilization, making the hybrid combination often more flexible and effective than the sum of its parts. A Hybrid system utilizes lower temperature SCNR injection to provide improved NOx reduction while generating higher ammonia slip. The residual ammonia slip is the reagent for a smaller SCR reactor that removes the slip and reduces NOx while limiting the costs associated with a larger catalyst volume." (http://www.durrenvironmental.com/NOXCS.asp "NOx Emission Control: Emission Origins and Available Control Solutions")

As does the EPA:

"....the (EPA)notes that hybrid combinations of SNCR and SCR could be used in new cement kilns to achieve greater reductions than would be possible with SNCR alone."
National Association of Clean Air Agencies, "COMMENT ON PORTLAND CEMENT NSPS 2009"

No matter what the pollutant increase cited in Holcim's permit application, SCR is the best technology to address its reduction and control. To sanction the installation of anything less the best option would be to invite unnecessary pollution problems in a location where there have been far too many already.

We support the installation of SCR at Holcim and we urge the company to submit an application that specifically calls for that option as a substitute for this "placeholder" permit application. On its merits, we urge the TCEQ to reject the current application as being too general, with too many unknowns, and without sufficient assurances that estimated pollution increases will be adequately controlled.

Submitted by
Downwinders at Risk Education Fund
✓Grace Darling, Chair
✓Jim Schermbeck, Director
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A hard copy of these comments is being mailed to the Chief Clerk's office.

Marisa Weber

From: PUBCOMMENT-OCC
Sent: Thursday, July 10, 2014 8:10 AM
To: PUBCOMMENT-OCC2
Subject: FW: Public comment on Permit Number 8996

H

From: darlingg@sbcglobal.net [mailto:darlingg@sbcglobal.net]
Sent: Thursday, July 10, 2014 12:55 AM
To: donotReply@tceq.texas.gov
Subject: Public comment on Permit Number 8996

NSR 92407

REGULATED ENTY NAME HOLCIM TEXAS

RN NUMBER: RN100219286

PERMIT NUMBER: 8996

DOCKET NUMBER:

COUNTY: ELLIS

PRINCIPAL NAME: HOLCIM TEXAS LIMITED PARTNERSHIP

CN NUMBER: CN601231459

FROM

NAME: MS Grace Darling

E-MAIL: darlingg@sbcglobal.net

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ARLINGTON TX 76010-2535

PHONE: 8172741077

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COMMENTS: Emissions by the Holcim cement kilns in Midlothian continue to be a major source of air pollution in North Central Texas, affecting Arlington and other densely-populated communities north and west of the Holcim plant itself through the pollution plume and prevailing winds. This application for a permit modification predicts increases in particulate matter, sulfuric acid, and carbon monoxide from operation of a regenerative thermal oxidizer to control total hydrocarbons. We find this approach unacceptable, of dubious

benefit to public health, and subject to economic uncertainty. The correct technology for Holcim to apply is selective catalytic reduction, which has been shown to decrease THC and is not associated with PM or CO rises. The evidence is clear that SCR offers the best management practice with regard to cement kiln emissions. We ask TCEQ to deny the current application and hold a public hearing to discuss the SCR alternative to RTO if the permit is to be modified. Thank you for your consideration.