



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 7
901 NORTH 5TH STREET
KANSAS CITY, KANSAS 66101
DEC 08 2011

Ms. Susan Heckenkamp
Construction Permits Unit Chief
Missouri Department of Natural Resources
Air Pollution Control Program
PO Box 176
Jefferson City, MO 65102

RE: Proposed Construction Permit
Continental Cement, LLC-- Hannibal,
Installation ID 173-00001,
Project No. 2010-10-007

Dear Ms. Heckenkamp:

EPA Region 7 received the proposed permit to construct to be issued to Continental Cement LLC (CCC) for their Hannibal, Missouri facility from Missouri Department of Natural Resources (MDNR) on November 9, 2011. Region 7 has reviewed the draft construction permit and is providing the following comments for MDNR's consideration.

Background:

The initial PSD construction permit issued July 11, 2006; Permit Number 072006-003; was prepared and evaluated as "the installation of a 3,300 ton of clinker per day preheater/precalciner Portland cement kiln, underground limestone mine and associated processes." The BACT analyses, associated permit limits and development and presentation of the potential to emit (pte) are based on this production rate and an operating scenario of 8,760 hours per year. Additionally; according to an analysis of Continental Cements potential to emit (pte), all of the SOx, VOC and CO is being "discharged through the main kiln stack (stack ID number 318SK1)"

A summary of the BACT permitted emissions included in this approved and issued construction permit being emitted from the main kiln stack (stack ID number 318SK1) compared to the CCC--Hannibal facility pte is shown in the following table:

Table with 7 columns: Criteria Pollutant, Permitted Emission Limit in lb/ton of clinker, Permitted Production Rate in tons of clinker/day, Potential Operating Time in days/yr, Permitted Emissions in tpy, pte in tpy, Permitted % of pte through stack 318SK1. Rows include PM10, SOx, VOC, and CO.



The second PSD permit to construct issued July 24, 2007; Permit Number 072007-008; was prepared and evaluated "to eliminate the Saverton Quarry, to develop a new onsite quarry and to **increase daily clinker production.**" CCC was permitted to increase their production to 3,500 tons of clinker per day; and at their request, was limited to a maximum production of 1,204,500 tons of clinker per year. This in effect reduced the number of operating days to 344 per year. Permit Number 072007-008 also permitted the use of sliding scale emission limits for PM₁₀, SO_x, VOC and CO; in lieu of a single numerical limit. The maximum limit on the sliding scale matched the single limit included in permit number 072006-003. So the end result was the CCC—Hannibal facility "potential to emit" (pte) remained essentially unchanged. Again, all of the SO_x, VOC and CO is being "discharged through the main kiln stack (stack ID number 318SK1)."

A summary of the second set of BACT permitted emissions included in this approved and issued construction permit being emitted from the main kiln stack (stack ID number 318SK1) compared to the CCC—Hannibal facility pte is shown in the following table:

Kimmswick limestone in raw mix	Criteria Pollutant	Permitted Emission Limit in lb/ton of clinker	Permitted Production Rate in tons of clinker per day	Potential Operating Time in hrs/yr	Permitted Emissions in tpy	Pte in tpy	Permitted % of pte through stack 318SK1
<=20%	PM ₁₀	0.33	3,500	8259	198.66	496.31	40
20% <=40%	PM ₁₀	0.37	3,500	8259	222.74	496.31	45
40% <= 60%	PM ₁₀	0.42	3,500	8259	252.84	496.31	51
60% <=80%	PM ₁₀	0.47	3,500	8259	282.94	496.31	57
>80%	PM ₁₀	0.516	3,500	8259	310.63	496.31	63
<=20%	SO _x	0.89	3,500	8259	535.78	1162.35	46
20% <=40%	SO _x	1.15	3,500	8259	692.30	1162.35	60
40% <= 60%	SO _x	1.41	3,500	8259	848.82	1162.35	73
60% <=80%	SO _x	1.67	3,500	8259	1,005.34	1162.35	86
>80%	SO _x	1.93	3,500	8259	1,161.86	1162.35	100
<=20%	VOC	0.05	3,500	8259	30.10	72.59	41
20% <=40%	VOC	0.07	3,500	8259	42.14	72.59	58
40% <= 60%	VOC	0.084	3,500	8259	50.57	72.59	70
60% <=80%	VOC	0.10	3,500	8259	60.20	72.59	83
>80%	VOC	0.12	3,500	8259	72.24	72.59	100
<=20%	CO	1.82	3,500	8259	1,095.64	2168.62	51
20% <=40%	CO	2.27	3,500	8259	1,366.54	2168.62	63
40% <= 60%	CO	2.71	3,500	8259	1,631.42	2168.62	75
60% <=80%	CO	3.16	3,500	8259	1,902.32	2168.62	88
>80%	CO	3.60	3,500	8259	2,167.20	2168.62	100

An amendment to permit Number 072007-008; (Permit #072007-008A) was prepared, evaluated and issued on March 20, 2009. The revised PSD construction permit allowed Continental Cement "to change existing permit limits (i.e. clinker production rate, limestone hauling rate, etc) and to add new emission points (natural gypsum truck delivery, limestone fines truck delivery, etc.)." Continental Cement was permitted to increase their production to 3,700 tons of clinker per day; while maintaining a maximum production limit of 1,204,500 tons of clinker per year. This in effect reduced the number of operating days to 325.5 per year (7,813 hrs/yr). The net emissions increase analysis associated with this amended permit #072007-008A indicates that there is no change in NOx emissions; and based on the potential to emit for the plant in Table 3: Emissions Summary, there are no expected increase in CO, VOC and SO2 and slight increases in PM₁₀ and HAP's. There was, however, a change to the BACT permitted emission limits. Amended permit #072007-008A added an emission limit for the use of 100% Burlington limestone

A summary of the amended set of BACT permitted emissions included in this approved and issued construction permit being emitted from the main kiln stack (stack ID number 318SK1) compared to the CCC—Hannibal facility pte is shown in the following table:

Kimmswick limestone in raw mix	Criteria Pollutant	Permitted Emission Limit in lb/ton of clinker	Permitted Production Rate in tons of clinker per day	Potential Operating Time in hrs/yr	Permitted Emissions in tpy	Pte in tpy	Permitted % of pte through stack 318SK1
100% Burlington	PM ₁₀	0.28	3,700	7,813	168.61	533.45	32
<=20%	PM ₁₀	0.33	3,700	7,813	198.72	533.45	37
20% <=40%	PM ₁₀	0.37	3,700	7,813	222.80	533.45	42
40% <= 60%	PM ₁₀	0.42	3,700	7,813	252.91	533.45	47
60% <=80%	PM ₁₀	0.47	3,700	7,813	283.02	533.45	53
>80%	PM ₁₀	0.516	3,700	7,813	310.72	533.45	58
100% Burlington	SO _x	0.63	3,700	7,813	379.37	1162.35	33
<=20%	SO _x	0.89	3,700	7,813	535.94	1162.35	46
20% <=40%	SO _x	1.15	3,700	7,813	692.50	1162.35	60
40% <= 60%	SO _x	1.41	3,700	7,813	849.07	1162.35	73
60% <=80%	SO _x	1.67	3,700	7,813	1,005.63	1162.35	87
>80%	SO _x	1.93	3,700	7,813	1,162.20	1162.35	100
100% Burlington	VOC	0.03	3,700	7,813	18.07	72.59	25
<=20%	VOC	0.05	3,700	7,813	78.28	72.59	41
20% <=40%	VOC	0.07	3,700	7,813	108.39	72.59	58
40% <= 60%	VOC	0.084	3,700	7,813	138.50	72.59	70
60% <=80%	VOC	0.10	3,700	7,813	168.61	72.59	83
>80%	VOC	0.12	3,700	7,813	198.72	72.59	100
100% Burlington	CO	1.38	3,700	7,813	831.00	2168.62	38
<=20%	CO	1.82	3,700	7,813	1,095.96	2168.62	51

20% <=40%	CO	2.27	3,700	7,813	1,366.94	2168.62	63
40% <= 60%	CO	2.71	3,700	7,813	1,631.89	2168.62	75
60% <=80%	CO	3.16	3,700	7,813	1,902.87	2168.62	88
>80%	CO	3.60	3,700	7,813	2,167.83	2168.62	100

The draft PSD permit to construct, (project number 2010-10-007) currently out for review and comment states it is for “the re-evaluation of the Best Available Control Technology (BACT) analysis for volatile organic compound (VOC) emissions for the main stack.” Draft permit goes on to say: “BACT analysis was performed during the last PSD review (construction permit no.072007-008, project no. 2006-11-095) and its subsequent amendment (permit no. 072007-008A, project no. 2008-01-017). For this permit, only the VOC BACT for the main stack (318SK1) was re-evaluated. The BACT analyses for other sources of VOC emissions (storage tanks and emergency generators) and for other pollutants (i.e. PM₁₀, SO_x and CO) in the previous permits are still valid.

Therefore the BACT emission limits being proposed along with their comparison to the facilities pte can be summarized as follows:

Kimmswick limestone in raw mix	Criteria Pollutant	Permitted Emission Limit in lb/ton of clinker	Permitted Production Rate in tons of clinker per day	Potential Operating Time days/ year	Permitted Emissions tons/year	pte tons/year	Permitted % of pte through stack 318SK1
<=20%	PM ₁₀	0.33	3,700	325.5	198.72	496.31	40
20% <=40%	PM ₁₀	0.37	3,700	325.5	222.80	496.31	45
40% <= 60%	PM ₁₀	0.42	3,700	325.5	252.91	496.31	51
60% <=80%	PM ₁₀	0.47	3,700	325.5	283.02	496.31	57
>80%	PM ₁₀	0.516	3,700	325.5	310.72	496.31	63
<=20%	SO _x	0.89	3,700	325.5	535.94	1162.35	46
20% <=40%	SO _x	1.15	3,700	325.5	692.50	1162.35	60
40% <= 60%	SO _x	1.41	3,700	325.5	849.07	1162.35	73
60% <=80%	SO _x	1.67	3,700	325.5	1,005.63	1162.35	87
>80%	SO _x	1.93	3,700	325.5	1,162.20	1162.35	100
100% Burlington	VOC	0.08	3,700	325.5	48.17	198.74	24
<=20%	VOC	0.13	3,700	325.5	78.28	198.74	39
20% <=40%	VOC	0.18	3,700	325.5	108.39	198.74	55
40% <= 60%	VOC	0.23	3,700	325.5	138.50	198.74	70
60% <=80%	VOC	0.28	3,700	325.5	168.61	198.74	85
>80%	VOC	0.33	3,700	325.5	198.72	198.74	100
<=20%	CO	1.82	3,700	325.5	1,095.96	2168.62	51
20% <=40%	CO	2.27	3,700	325.5	1,366.94	2168.62	63
40% <= 60%	CO	2.71	3,700	325.5	1,631.89	2168.62	75
60% <=80%	CO	3.16	3,700	325.5	1,902.87	2168.62	88
>80%	CO	3.60	3,700	325.5	2,167.83	2168.62	100

CCC's application for this current PSD construction permit and MDNR's draft permit states that it was determined that the original BACT analysis did not take into account the following factors:

- The original BACT analysis was performed considering only the emissions from the kiln and not the coal mill stack. In the original application for permit 072006-003, the facility designed the plant to have separate stacks for the coal mill and for the kiln. However, during the permitting process, it was determined that having separate stacks will require one year of ambient air monitoring for sulfur oxides (SO_x). Therefore, the facility made a decision to relocate the coal mill stack emissions to the main stack as the Good Engineering Practice (GEP) stack height provided SO_x emissions below the level where ambient monitoring was required. The BACT analysis was not revised to reflect the additional emissions from the coal mill.
- The original BACT analysis was based on limited samples of kiln feed and did not adequately account for the variability of organic material in the limestone. Additional data have indicated that the average organic content is higher than shown by the limited test results.
- The original BACT analysis was based on calculations from KHD laboratories. KHD calculated an average TOC for the blend, and then used a factor of one percent to calculate a theoretical VOC emission. KHD reported this number to Continental as VOC and also converted to "as propane." However, when setting the original BACT, Continental Cement Company, LLC used the VOC value based on carbon only. This put the original estimate 22% lower than it should be since the carbon molecular weight in propane is 22% less than the total molecular weight of propane.
- When the BACT numbers were set in the original analysis, KHD assumed that 1% of the total organic compounds (TOC) would be VOC. However, observed data since the issuance of the permit 072006-003 suggests that 2% should be used.

Comments:

1. According to permit to construct 072006-003 and permit to construct 072007-008; 63% of the facilities PM₁₀ potential to emit; 100% of the facilities SO_x potential to emit; 100% of the facilities CO potential to emit and 100% of the facilities VOC potential to emit is being discharged through the main stack (stack ID number 318SK1).
Therefore, the source of the information that leads to the statement "*The BACT analysis was not revised to reflect the additional emissions from the coal mill*" is unclear.
It appears that the BACT analysis completed in 2006 and again in 2007 did in fact include all of the SO_x, CO and VOC that could potentially be emitted.
Therefore, Continental Cement and MDNR should further develop the explanation which justifies this re-evaluation reason.
2. This draft PSD construction permit (project number 2010-10-007) indicates that "*BACT analysis for other pollutants; PM₁₀, SO_x and CO, in the previous permits is still valid.*" Continental Cement's application describes in detail the formation of and the relationship between CO and VOC in the kiln system and the organic material content of the limestone used as raw material. The discussion of CO and VOC from kiln feed also indicates there may be an impact on formation of CO₂. Therefore, it is not clear how a change in limestone organic content only impacts the VOC's emitted and not the emissions of CO and CO₂.
Therefore, Continental Cement and MDNR should detail the reasons why there is not a significant increase in CO and CO₂ and include data to support the position.
3. Continental Cement's application discussion of the need for revised VOC limits includes a discussion regarding the contribution of non-VOC's; such as methane. The application indicates that an average 68% of the measured THC was methane. However, Continental did not provide in their application and MDNR does not include in their draft PSD permit an analysis and discussion as to why the greenhouse gas (GHG) PSD requirements are not triggered.
This apparent potential increase in methane coupled with the potential increase in CO₂ generated (as discussed in comment 2. above) appears to indicate a potential significant increase in GHG emissions. Therefore, Continental Cement should explain why a GHG BACT analysis is not required.

4. Continental Cement proposes a BACT limit for VOC's of 0.21 lb/ton clinker, 30-day rolling average; however, the draft permit includes a VOC BACT limit which varies from 0.08 to 0.33 lb/ton clinker. The limit is based on amount of Kimmswick limestone in the raw material feed; as shown above. Therefore, MDNR should provide detail as why they chose to include a sliding scale VOC BACT limit, in lieu of Continental Cements requested limit of 0.21 lb/ ton clinker.

5. A May 5, 2011 email from Continental Cement to MDNR discusses comparing the 01/24/2006 BACT (old) with the 10/25/2010 BACT (new). Continental's commentary on why the RTO/WLS is not feasible includes the statement that "*the cost per clinker ton is lower in the new BACT, partly because of the lower annual cost but also because of the much higher annual clinker production (365 x 3700 TPD).*"

Special condition 4 in the amended permit #072007-008A issued to Continental Cement for this kiln system limits the kiln system to 3,700 tons of clinker per day and 1,204,500 tons of clinker per year, on a 12-month rolling average.

The email referenced above would indicate that Continental Cement plans to increase capacity to 8,760 hours per year which would equate to an annual production of 1,350,500 tons. If in fact this is the case; there would appear to be a potential increase; not only VOC but also PM₁₀, NO_x, SO_x, CO and GHG. These increases should be analyzed for significance and the construction permit modified accordingly.

However, if this is not the case; MDNR should explicitly state that all of the other approved construction permit special conditions continue to apply.

It is suggested that Special Condition 1. be modified to say:

Superseding Condition

The conditions of this permit supersede special condition 11.A.1), 11.A.3), 11. A.4), 11.A.5), and 11.A.6) found in the previously issued construction permit no. 072007-008C issued by the Air Pollution Control Program. All other special conditions in construction permit no. 072007-008C remain in effect.

If you have any questions, please contact Bob Cheever by phone at 913.551.7980 or email at cheever.robert@epa.gov. Thank you again.

Sincerely,



for Mark A. Smith
Air Permitting and Compliance Branch