April 12, 2002

Mr. Mark Ashley
Golden Casting Corporation
1616 Tenth Street
Columbus, Indiana 47201

Re: Interim Significant Source Modification Petition
I-005-15288I-00006

Dear Mr. Ashley:

On February 5, 2002, the Office of Air Quality (OAQ) received an interim significant source modification petition from Golden Casting Corporation located at 1616 Tenth Street, Columbus, Indiana for construction of a two new core machines.

Public notice of the interim significant source modification petition was published on March 14, 2002. The public comment period ended on March 28, 2002. On March 26, 2002, Charles Mitch, submitted the following comments with the corresponding OAQ responses:

Comment 1

I find the proposed interim construction permit to be either incomplete or inaccurate. Emissions of HAPs exceed 25 tons per year, even after the proposed emission limitations (see emission summary included in the proposed permit). No description is given of the composition of the HAPs other than the single HAP of triethylamine (TEA). I request that a listing of all HAPs be added to the proposed permit. I also request that the proposed permit be brought into compliance with the New Source Toxics provisions of 326 IAC 2-4.1-3 as required for new sources with combined HAP emissions exceeding 25 tons per year. A case-by-case determination of maximum achievable control technology (MACT) for each HAP must be provided to satisfy the requirements of 326 IAC 2-4.1-3 and section 112(g) of the Federal Clean Air Act.

Response #1

Golden Casting proposed production limits and short-term emissions limits which will ensure that less than 25 tons per year of VOCs are emitted from the new core machines. All of the hazardous air pollutants (HAPs) from the new core machines are also VOCs; therefore, the emission limits sufficient to limit VOC to less than 25 tons per year will also limit HAPs from the new core machines to less than 25 tons per year. Compliance with this limit renders the requirements of 326 IAC 2-4.1-3 (New Source Toxics Control) not applicable to the new core machines. A list of all HAPs emissions from the core machines is shown below. This table shows HAPs emissions from the core machines as limited by the permit.

Hazardous Air Pollutant	Limited Emissions (tons/year)
triethylamine (TEA)	3.50
formaldehyde	0.53
xylene	1.58
cumene	0.87
naphthalene	1.58
biphenyl	0.71
Total HAPs	8.77

Comment #2

The emission limitation proposed for TEA as a single HAP would still allow emissions up to 10 tons per year of TEA. I request that core production be more specifically limited to less than 10,000 tons of core per year, so as to keep TEA emissions at less than 10 tons per year to avoid the threshold requirements pertinent to 326 IAC 2-4.1-3.

Response #2

Golden Casting has agreed to accept a permit condition limiting the amount of cores produced on the new core machines to 3,500 tons per year. Golden Casting has also agreed to a limit of 2.0 pounds of TEA per ton of cores produced. This is equivalent to TEA emissions of 3.50 tons per year, which is below the 10 ton per year applicability threshold for 326 IAC 2-4.1-3 (New Source Toxics Control).

Comment #3

The proposed interim construction permit fails to mention any requirements for compliance monitoring and/or certification to demonstrate that the proposed emission limits on TEA and VOC are being satisfied. I request that conditions for compliance monitoring and compliance certification for the proposed operational limits be included in the construction permit as well as the eventual operating permit for this source.

Response #3

Golden Castings submitted two amendments to their interim construction permit application. One was submitted on March 26, 2002 and another on April 2, 2002. In the April 2, 2002 amendment, Golden Castings stated that they would agree to permit conditions requiring them to keep records and submit quarterly reports of TEA and core resin usages each month. These records and reports will be sufficient to demonstrate compliance with the limits in the permit.

Comment #4

The proposed operational limits are derived from calculations based on emission factors of 3.00 pounds of VOC per ton of core, and 2.00 pounds of TEA per ton of core. No references or documentation to support the reliability of these emission factors is provided. To better validate the emission factors, I request that stack tests for VOC, TEA, and all other HAPs, be required so as to assure compliance with the proposed emission limits under actual operating conditions. I request that requirements for these stack tests be included in both the interim construction permit and the eventual operating permit for this source.

This source is situated in close proximity to a densely populated residential neighborhood as well as several schools and a child care center. Protection of human health and well-being, as required by Indiana law and the Federal Clean Air Act, demands that careful attention be given to compliance with the proposed operational limits.

Response #4

The TEA emissions were estimated by assuming that 100% of all the TEA used in the core making process would be emitted to the atmosphere. The TEA usage was estimated by taking the highest TEA usage possible for any core made in the process and assuming that high usage would occur for every core made by these new core machines. These conservative estimates of TEA emissions make it unnecessary for IDEM to require stack testing for the TEA emissions. Even with these conservative estimates, TEA emissions will be limited to 3.5 tons per year. Additionally, Golden Casting operates TEA scrubbers which are designed to capture over 99% of the TEA emissions from all of the Isocure core machines at their plant. The TEA is then sent off-site to be recycled. The scrubbers are not required by this permit because they are not needed for Golden Casting to demonstrate compliance with the TEA emission limit of 3.5 tons per year. However, the use of the TEA scrubbers will effectively reduce TEA emissions from the new core machines to less than 0.35 tons per year.

In addition to TEA emissions, other VOCs will be emitted from the partial evaporation of the resin material which is used to bind the core sand together to make a solid core. Some of the resin does not evaporate, but remains inside the core to help bind the core sand. IDEM does not have sufficient information to know exactly when and where in the foundry process these binder materials evaporate. Past stack testing at similar facilities and laboratory studies show that some amount of evaporation likely occurs at various stages of the foundry process, including mixing the core sand with the resin, making the cores, storing the cores, pouring the molten metal into the sand molds with the cores inside, cooling the metal castings inside the sand molds with the cores still inside, and separating the metal casting from the sand mold and the cores. These processes are typically called mixing, core making, core storage, pouring, cooling, and shakeout, respectively. The amount of evaporation that occurs at each stage of the process is partially dependent on how much time each core spends at each part of the process. Another variable affecting the evaporation rate is the surface area of the core.

EPA has published a compilation of air pollutant emission factors (AP-42) which includes VOC emission factors for pouring, cooling, and shakeout. These emission factors were used to estimate the increased VOC emissions that could occur from the existing pouring, cooling, and shakeout processes at Golden Casting as a result of adding the two new core machines and producing additional castings. The EPA document (AP-42) does not include any emission factors for VOC emissions from the type of core machine that Golden Casting plans to install; therefore, IDEM had to consult other sources of information to estimate those emissions.

Some laboratory testing done by the Ohio Cast Metals Association (OCMA) in conjunction with Ohio EPA indicates that for the type of resin Golden Casting will be using in these new core machines, the partial evaporation of the resin would result in VOC emissions of 0.65 pounds per ton of cores. The study stated that this emission factor represents VOC emissions from mixing, core making, and core storage. The study did not provide adequate information as to what percentage of those emissions occur at mixing, versus core making, versus core storage. IDEM has performed some limited stack testing for total VOC from similar core machines and mixers at other foundries. The results have showed total non-TEA VOC emissions from mixing and core making to be greater than 0.65 pounds per ton of cores. Therefore, IDEM did not want to rely on the 0.65 pound per ton emission factor to estimate VOC emissions from the new core machines at Golden Casting. Stack testing existing core machines is difficult and expensive because most of them are not completely enclosed and are not vented directly to stacks. Therefore, both IDEM and Golden Casting wanted to use a very conservative emission estimate for the VOC emissions from the core machines, so that stack testing the new core machines would be unnecessary. IDEM and Golden Casting agreed to use an emission factor of 1.2 pounds per ton instead of the 0.65 pound per ton factor determined by the OCMA study. By using very conservative VOC emission estimates for each step

in foundry process, IDEM is likely doing some "double-counting" of the VOC emissions that actually occur from the partial evaporation of the resin. However, these conservative estimates are preferable to extensive stack testing requirements.

When the operation permit is issued, it will include extensive compliance monitoring and record keeping requirements to ensure that Golden Casting complies with all of the emission limits in the permit. Additionally, Golden Casting will be required to perform stack testing for some of the existing sources which will increase utilization as a result of this project.

Pursuant to 326 IAC 2-13-1(i), the interim significant source modification petition is in effect on April 14, 2002 and expires on the effective date of the final significant source modification permit. The interim significant source modification petition may be revoked after its effective date upon a written finding by the Indiana Department of Environmental Management (IDEM) that any of the reasons for denial in 326 IAC 2-13-1(h) exist or if the final significant source modification permit is denied. The IDEM has reviewed this interim significant source modification petition and has not found any such reason. The facilities specified in the interim significant source modification petition may not operate until the final significant permit modification is issued by OAQ.

The interim significant source modification petition is federally enforceable. Detailed construction and operation conditions will be specified in the final significant source modification permit 005-15288-00006.

If you have any questions regarding this interim significant source modification petition, please contact Nisha Sizemore of my staff at 317-232-8356, or at 1-800-451-6027 (ask for extension 2-8356).

Sincerely,

Original Signed by Paul Dubenetzky
Paul Dubenetzky, Chief
Permits Branch
Office of Air Quality

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Enclosure: Interim Permit Evaluation (3 pages)
cc: File -- Bartholomew County
Bartholomew County Health Department
Air Compliance Section – Richard Sekula
Permit Administration - Sara Cloe