

Why did the Borough Approve the Titan 2 Coal Boiler? Questions and Answers

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This report relies on the Dec. 23, 2012 draft OMNI Report and appendices and will be revised if new data is made available.

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Draft Report: [Why did the Borough Approve the Titan 2 Coal Boiler? Questions and Answers](#)

Transcript (partial): [Air Pollution Control Commission hearing, Jan. 31, 2012](#)

Executive Summary

The Fairbanks North Star Borough approved the Titan 2 coal boiler on January 24, 2012. During a hearing of the Air Pollution Control Commission, news of this approval was withheld from the commission and the public. Just a week after the Titan 2 coal boiler was approved for installation Borough staff responded to commissioners' questions: "*current code prohibits the installation of coal appliances.*" Commissioners were also kept in the dark about the testing procedures and emissions data used to approve this coal boiler. These data show Titan 2 was not qualified to pass the emission limit standard for fine particle pollution (PM 2.5). These data also show the smoke from Titan 2 contained high levels of toxic metals as well as sulfur and nitrogen oxide gases which convert to secondary PM 2.5. The approval of Titan 2 based on flawed testing and inadequate consideration of pollutants was made in error and violates current code.

Time Magazine places Fairbanks in a tie for fourth worst fine particulate levels in the nation, see [Time Magazine's Ten Most Air-Polluted Cities in the US](#) 9/29/2011. Efforts are needed to support bringing the nonattainment area of the Borough into attainment with PM 2.5 standards by the Dec. 2014 EPA deadline. No action should be taken which increases unhealthy concentrations of smoke in neighborhoods and near schools and delays opportunities to meet attainment as soon as possible.

ACTIONS NEEDED:

1. The approval of Titan 2 should be immediately withdrawn.
2. The language in 2012-09 to allow the Borough to approve coal-burning appliances must also be withdrawn.
3. The Assembly should order a full investigation of Borough procedures used to approve an improperly tested and polluting coal boiler.

Clean Air Fairbanks reveals what the APCC was told, the process and procedure used to approve Titan 2, the results of emission tests performed by OMNI lab in Portland, Oregon, Titan 2's threat to attainment, issues of conflict of interest and special interest, the changes proposed to current code, and what may be approved next. The intent of this report is to make transparent the facts, data, and judgments behind the flawed decision to approve the Titan 2 coal boiler.

What is the first coal-burning appliance approved for installation in the FNSB PM 2.5 nonattainment area?

[Decker Titan 2](#), a 440,000 BTU auger-fed coal-fired boiler sold locally by [North Pole Coal/OIT, Inc.](#), is the first coal-burning appliance approved by the Borough. Dr. Jim Conner, Fairbanks North Star Borough Air Quality Manager, approved Titan 2 Jan. 24, 2012, citing his “discretionary authority.” [1/24/2012 approval letter](#).

Was the Air Pollution Control Commission informed at or before its hearing on Jan. 31 that Titan 2 had already been approved?

No. On the contrary, Titan 2 was described as “prohibited for installation” until a key change was made to Borough code. The APCC was told current code “prohibits installation of coal appliances” and that code had to be changed to allow new coal appliances to be installed in the nonattainment area. Titan 2 was never mentioned by name, but called “very clean,” “good technology,” “an opportunity,” and “a better burning coal stove.”

Borough tapes of the hearing have been transcribed, [link to transcript](#). Following are some of the explanations given commissioners and the public at the Jan 31, 2012 APCC hearing:

Assembly member Nadine Winters stated, “It came up recently I believe that, **I think it was a coal-fired coal burner**, there was no EPA standard for it, so it was a long and tedious process.”

Transportation Director Glenn Miller, supervisor of the Air Quality Program, said, “Well, **right now the current code prohibits the installation of coal appliances**. So, because the EPA exempts the coal appliances, that really doesn’t have anything to do with whether or not they are installed here. It’s just a matter of what standard do you use to certify that particular appliance. **Right now coal appliances are prohibited for installation....** There are some new appliances that are out there now, for example the one we just looked at, that appear to be **very clean** as far as PM 2.5 is concerned. **If that appliance is approved**, that means those older appliances could be upgraded and replaced with this new appliance, which could mean less PM 2.5 for us.”

Assembly member Nadine Winters added, “I guess there is the negative view that there might be more coal appliances.... We’re fixing a situation where there possibly could be good technology, good things out there that might help us with attainment, might help us with PM 2.5, might help us with health. And it fixes a technical situation where we might possibly do ourselves plenty of good.”

Mayor Luke Hopkins stated, “Coal, this particular issue that we are discussing here had comment and some commissioners are concerned about the door we are opening. But, what we are trying to do is get these older stoves replaced, and coal is one of the issues. There is an opportunity to have a, so far what we have found it appears, a better burning coal stove. **That is what [lines] 55 and 56 would allow us to be able to, if we had this language in here.**”

Where in code is the “discretionary authority” used to approve Titan 2?

It does not exist. The [1/24/2012 approval letter](#) refers to “discretionary authority.” There is no foundation in Borough code for this authority. Current code contains “shall” language and not one “may.” Two paths for approval are allowed: 1) if EPA certified or Phase 2 qualified or 2) if tested and established to meet EPA’s emission limit standard for that appliance. See [FNSB Chapter 8.21.020 A](#). Under current code, staff have no discretion to authorize appliances otherwise prohibited by code. To say otherwise is an abuse of authority.

Why push the APCC to support changing code to allow coal devices when Borough staff already claim “discretionary authority” to approve Titan 2?

Did the cart get before the horse? **Evidently.** Lacking actual “discretionary authority,” the sponsors propose to change code to authorize ample latitude so staff can approve more coal devices.

If Borough staff believe Titan 2 is “very clean,” why not share the testing procedures and results with the APCC?

Exactly. Links to review the draft Dec. 23, 2011 OMNI Report and its appendices and the Jan. 24, 2012 Sierra Research Critique are provided in this report. Members of the public, APCC, and elected officials are encouraged to review the data and draw their own conclusions.

On Feb. 3, 2012, Scott Hedges with EPA informed Clean Air Fairbanks that the Borough had already approved Titan 2. If it weren’t for Mr. Hedges’ candor, the Titan 2 approval might still be under wraps.

Is Titan 2 “very clean” as described by Transportation Director Miller to the APCC?

Titan 2 is not “very clean”. The Titan 2 was only tested at low. At low burn rate, “35% of the maximum achievable heat output” ([OMNI Report, p 15](#)), Titan 2 emitted 7.782 grams/hour PM 2.5 ([OMNI Appendix #29, A23](#)). At maximum burn rate (100%), Titan 2 would be expected to emit over 22 grams/hour. [100/35 x 7.782] EPA’s test procedures go hand-in-hand with EPA’s emissions limit cap. To qualify for Phase 2, a hydronic heater must not exceed the 18 grams/hour cap limit in two test runs at **maximum burn rate** (EPA Phase 2 emissions cap and test protocols for continuous-feed models p 5 <http://www.epa.gov/burnwise/pdfs/owhhphase2agreement.pdf>). Further, the smoke from Titan 2 was found to contain high levels of toxic metals ([OMNI Appendix #29, A23](#)) and sulfur and nitrogen oxides ([OMNI Report, p 17](#)) compared to the other devices tested.

Other than primary PM 2.5, what were Titan 2's other emission products?

Even at low, Titan 2 emitted the most grams per hour of sulfur and nitrogen oxides of the nine devices tested ([OMNI Report, p 17](#)). These noxious gases convert to secondary PM 2.5, but OMNI **did not consider secondary PM 2.5** impacts to our nonattainment air.

In addition, Titan 2 at low burn, discharged many times the **lead** and **selenium** compared to devices burning other fuels ([OMNI Appendix #29](#)). Titan 2 emitted over **265 times more lead** than an EPA-certified wood stove (Drolet Escape 1800) and **34 times more lead** than an EPA-Phase 2 outdoor wood boiler (Central Boiler 1400). **Selenium** was also emitted by Titan 2, at levels vastly higher than wood devices. Toxic metals emitted at these rates cannot be considered "very clean."

Titan 2 emissions were not tested for **beryllium** or **mercury**.

Usibelli mine coal from Healy contains "high concentrations of lead and selenium and low concentrations of beryllium and mercury, all of which are designated as hazardous air pollutants (HAPs) by the 1990 Clean Air Act Amendment," [USGS report, Healy Coal Quality](#).

Does Titan 2 now qualify for change-out funds?

Yes. Because Titan 2 has been added to the list of approved appliances effective Jan 24, 2012, a resident may remove an unqualified device and replace it with Titan 2 and receive \$2,500 in cash, see [FNSB Chapter 8.21.030](#) Voluntary removal, replacement, or repair program.

The APCC were told that when an unqualified stove was removed, **if** the Borough had an approved (qualified) coal device, the resident could receive funds from the voluntary change-out program. Review this dialog from the [Jan. 31, 2012 APCC hearing transcript](#):

Mayor Hopkins: "But also, you are changing out a woodstove to burn coal, **the program would be, in our voluntary change out program** it would be, if you wanted to change out your stove and get some financial compensation you have to have a stove that doesn't even meet the standard. But you could stay outside of the voluntary program if it was an approved stove to install in the borough, yes."

Commissioner Mark Sherman: "So I understand what you just said, that the borough is not going to fund your new coal stove if you are going to change it out."

Mayor Hopkins: "Our standards right now I believe don't have a voluntary program in there for coal."

Commissioner Mark Sherman: "If you have a wood stove and you want to put a coal stove in its place, the borough is not going to help fund that."

Mayor Hopkins: “I don’t have the code right in front of me, but actually to replace a non-compliant wood stove you can change it out in the voluntary change out program to coal if we have an approved device.”

Commissioner Gwen Holdmann: If it is an approved device, but right now there are no approved coal devices because they are exempted by EPA, but under this it would allow you to replace one.

Mayor Hopkins: a solid fuel-burning device, not just woodstove, right.

Do the testing procedures and emission data demonstrate Titan 2 will help us meet attainment?

No. The most likely target market for Titan 2 are businesses currently heating with heating oil. Testing by the OMNI lab in Portland, Oregon, under contract to the Borough, found even at low, Titan 2 emitted over **60 times** the primary PM 2.5 compared to the oil furnace burning #2 heating oil ([OMNI Appendix #29 on A23 and #17 on A14](#)). At high, Titan 2 would be expected to discharge over **175 times** the primary PM 2.5 compared to the oil furnace. [(100/35 x 7.782) / .1265]

North Pole Coal/OIT, Inc, the dealer of Titan 2 is selling Titan 2 at cost to open up a new market opportunity to sell many tons more coal, see [Selling Titan 2 to Sell TONS More Coal](#). The [“business plan” of OIT is to sell a “large number” of Titan 2 coal burners](#), presumably through North Pole Coal. Some may see a resemblance to marketing by heroin dealers who offer free or discounted needles.

Dr. Conner is concerned, as he agreed during a Feb. 16, 2012 conversation, that Titan 2 will replace oil stoves and contribute to our nonattainment problem.

If a “large number” of Titan 2 coal boilers are installed to replace oil furnaces, it will increase the pollution and make it more difficult to reach attainment. More people will experience health effects and damage. Efforts are needed to improve air quality as quickly as possible, not to roll us backwards to benefit a special interest.

An additional uncertainty is the effect of low ambient temperatures on emission rates. Dr. Conner had concerns about OMNI performing the tests in a warm warehouse rather than at ambient winter temperatures that go below minus 40°F. This concern was [raised by Dr. Conner in an email on 6/6/2011, the day before Titan 2 was tested](#). As wet stoker coal has a 33.5% moisture content ([OMNI Report, p 15](#)), at colder temperatures a substantial amount of ice will feed directly into the combustion chamber along with the coal This cooling could increase the byproducts of incomplete combustion.

How dirty is Titan 2 at maximum burn rate?

Impossible to know for sure since it was only tested at low. However, maximum burn rate is nearly three times the tested 35% heat output rate. Thus, emissions should be multiplied by nearly a factor of three for each pollutant in the absence of any proper maximum burn rate test results.

Should Titan 2 have been tested at HIGH or LOW?

A continuous-feed model like Titan 2 will have the highest PM 2.5 emissions at HIGH.

It is helpful to understand the difference between a continuous-feed model (such as an auger-fed Titan 2) and a woodstove. A continuous-feed model is engineered to burn hot but emits proportionally more grams per hour at **high** heat output which is controlled by the fuel feed rate. A woodstove works the opposite way and emits the most PM 2.5 smoldering at **low** when air supply is controlled. EPA's test procedures require a woodstove to be tested at a range of four burn rates from high to low. EPA is so confident that a continuous-feed hydronic heater's highest emissions are at maximum burn, that only two tests are required; however, both **must** be at maximum. Two tests at low are insufficient to qualify any continuous-feed hydronic. It bears noting that the Borough had OMNI test an auger-fed wood pellet stove at high, but only for a single test later determined by Sierra Research to be questionable.

Testing the continuous-feed Titan 2 at low is a serious error that underestimates all emission products by nearly a factor of three. As Titan 2 burns hot, emission products are proportional to the volume of fuel. Therefore, if Titan 2 emitted the same PM 2.5 g/hr burning wood pellets at low, it would have surely failed EPA's Phase 2 g/hr cap at maximum burn rate.

Why was Titan 2 not tested at HIGH?

OMNI followed Dr. Jim Conner's order to test Titan 2 at "low burn" ([5/10/2012 email with description of Titan 2 test protocol](#)).

There may not have been enough stoker coal to run Titan 2 on high. According to the 5/10/2012 email, "It looks like you will need to send 2 days worth of our coal to Omni Test Labs, as there is not enough from the amount that we sent." OMNI completed two tests of Titan 2 in one day with less than seven hours of burn time.

What was the basis of the Borough's decision to approve Titan 2?

In a meeting on Feb. 16, 2012, Dr. Jim Conner described that he approved Titan 2 based on his own visual observations, at the urging of his boss, Glenn Miller, who also watched Titan 2 while it was burning, and on its grams of PM 2.5 per kilogram of fuel. Dr. Conner said he doesn't think grams per hour is a good comparison between devices. Regardless, grams per hour -- not grams per ton of fuel -- is the metric used by EPA to certify woodstoves and qualify Phase 2 hydronic heaters. No emissions limit standard exists for grams of PM 2.5 per kilogram or ton of fuel.

As PM 2.5 is so small, visual assessments are unreliable and unscientific. Using PM 2.5 per unit of fuel is a highly atypical metric to assess a model's contribution to our local air quality problem. From an air quality perspective, does it matter how much PM 2.5 a ton of coal makes? It is far more essential to know how much PM 2.5 is coming out of that chimney in an hour.

Dr. Conner's case file contains a draft denial letter for Titan 2 based on the restriction in current code. On Jan. 23, 2012, he said he received a communication from Borough Attorney Rene Broker notifying him that he had "discretionary authority" to approve Titan 2. Dr. Conner did not know where this authority came from and did not have a written explanation. Prior to this communication from the Borough attorney, Dr. Conner stated that he thought new installations of coal appliances in the nonattainment area were prohibited by code.

Transportation Director Glenn Miller, who oversees the Air Quality Program, emailed Dermot Cole with the [Fairbanks Daily News-Miner](#) that the discretionary authority was in [FNSB Chapter 8.21.020](#). As mentioned above, this code does not address discretionary authority.

Was Dr. Jim Conner ordered on Jan. 24, 2012 to approve Titan 2?

Possibly. In the February 16 meeting, Dr. Connor stated that he had been "asked" to approve the Titan 2 by other borough staff but would not say who. The approval may have been ordered by Transportation Director Glenn Miller or Mayor Luke Hopkins. Justification may have been political, but it was not technical.

The standard used by Dr. Conner to approve Titan 2 was grams per kilogram but no emissions cap limit exists for this invented metric. This approval ignored the bias of testing Titan 2 only at low and its high emissions of toxic metals, sulfur and nitrogen oxides, and secondary PM 2.5.

Dr. Conner's concerns that Titan 2 would lead to a net increase of PM 2.5 emissions and that Titan 2 was not tested at ambient winter temperatures speak to his own misgivings about approving Titan 2. The results of the two OMNI tests of Titan 2 do not support approval according to EPA Phase 2 test procedures and grams per hour PM 2.5 emission limit standard. Regardless, Titan 2 was approved.

Does the supervisor of the Borough Air Quality Program have a conflict of interest?

It is common knowledge among Borough Air Quality employees that Transportation Director Glenn Miller heats with coal. In a meeting on Feb. 16, 2012, Dr. Conner described how his boss had "learned to burn coal cleanly." Mr. Miller supervises Dr. Conner, who approved the Titan 2. Mr. Miller purchases his coal from the recipient of the approval letter. Mr. Miller reports to the APCC the Titan 2 is "very clean" but fails to disclose it had already been approved a week earlier. Glenn Miller oversees the Borough "complaint driven" air quality program that has received over 500 complaints but not found a single violation or issued a single citation. Mr. Miller lives within 600 feet of Raven Landing Retirement Community for seniors and 700 feet of Denali Elementary School. A resident nearby has experienced serious health effects from coal

smoke in the neighborhood. What recourse is there for residents harmed by Mr. Miller's coal smoke?

It is offensive to observe the lack of commitment to our laws and public process. The Air Pollution Control Commission is a body of individuals, each highly qualified and esteemed in his or her field. Yet, they were kept from knowing that a coal-burning boiler tested at low, yet emitting high levels of primary and secondary PM 2.5 and toxic metals, has now been unleashed in our neighborhoods.

Who paid to test Titan 2?

The public. The cost of the two OMNI lab tests to qualify Titan 2 were \$12,650 and \$9,743. This total of \$22,393 was paid by the Borough. This was part of the \$300,000 paid by the Borough to OMNI lab for a total of 41 tests on 9 models of heating devices. The Borough purchased the Usibelli stoker coal for the test from North Pole Coal, the only coal dealer in the Interior. Additional expenses of the Borough's efforts to qualify Titan 2 include time spent by Sierra Research and Borough staff to plan the tests and evaluate the results.

The Borough has no fee for services to approve coal or other prohibited appliances.

Has the process of approving Titan 2 distracted the Borough from its greater priority of collecting data to support the plan to meet attainment?

Yes. The approval of Titan 2 distracted the Borough from gathering adequate data to prepare modeling for the State Implementation Plan (SIP) planned to be submitted to EPA in June 2013 (6 months late). A wood pellet hydronic was not tested. Wet wood was not tested although 60% of wood burned locally is wet, [Space Heating Appliance Survey 2010/2011 p 25](#). Secondary PM 2.5 generated by coal-burning appliances is not being considered except for that from coal-fired power plants. According to Sierra Research, 13 of 35 OMNI lab test runs involved serious "shortcomings" and "are of limited use." Further, "replicate testing was not conducted" and there was "no quality assurance plan" for the study, [Sierra Research Critique, p 6](#). A multitude of problems with the draft OMNI Report, not just with the testing of Titan 2, undermine the quality of data needed for the SIP. The SIP needs to present a credible plan to reduce PM 2.5 exceedances or EPA will reject it and proceed with serious economic sanctions for our region.

What was the purpose of the APCC hearing on Jan. 31, 2012?

The purpose of the APCC hearing was to review [Ordinance 2012-09, proposed Jan. 26, 2012](#). Public testimony during the hearing opposed Section 1 (lines 55-56) allowing the Borough to approve coal-burning appliances.

Existing ordinance, as approved by the Assembly, prohibits new installations of solid fuel burning appliances unless either EPA certified or, in the case of hydronic heaters, at least EPA Phase 2 qualified, effective July 12, 2010, see [2010-28](#). EPA has no approved coal-burning appliance or emissions limit for a coal appliance.

2012-09 allows the Borough to approve a device that meets “an emissions limit standard equivalent to that of a listed appliance.” The proposed language is underlined below.

8.21.020 Prohibited acts and requirements. [FNSB Code 8.21]

Section 2. A. Emissions Limit in the Nonattainment Area.

1. No person shall install or allow the installation, within the nonattainment area, of a solid fuel burning appliance unless it is listed by the borough as qualifying under this chapter and the installation complies with all other requirements imposed in this chapter. It shall be unlawful to install or fail to remove a solid fuel burning appliance installed in violation of this section. The appliance shall be so listed by the borough if:

- a. The appliance is certified by the U.S. Environmental Protection Agency as meeting the federal emissions limit standard appropriate for that appliance or in the case of hydronic heaters are at least phase II qualified. For purposes of this subsection, “certified” means that the solid fuel appliance meets emission performance standards when tested by an accredited independent laboratory and labeled according to procedures specified by the EPA in 40 CFR 60 Subpart AAA; or
- b. The appliance is tested by an accredited independent laboratory, or other qualified person or entity approved by the borough, establishing that it meets the EPA emissions limit standard appropriate for that appliance or an emissions limit standard equivalent to that of a listed appliance.

Have the sponsors offered a revised ordinance to allow the Borough to approve coal appliances?

Yes. A revised ordinance, [sponsor substitute Ordinance 2012-09](#), was proposed Feb. 9, 2012. It adds four words (in **bold**) to Section 2:

- b. The appliance is tested by an accredited independent laboratory, or other qualified person or entity approved by the borough, establishing that it meets the EPA emissions limit standard appropriate for that appliance or an emissions limit standard equivalent to that of a listed appliance **in a similar category.**

Section 2 of both [Ordinance 2012-09, proposed 1/26/2012](#) and [sponsor substitute Ordinance 2012-09, proposed 2/9/2012](#) allow staff broad discretion to approve more coal-burning appliances for the PM 2.5 nonattainment area.

The original proposed ordinance and the substitute ordinance appear to allow the Borough to approve an auger-fed coal boiler as though it were burning wood pellets. Wood and coal could be considered “equivalent” and “in a similar category.” As revised, coal-burning appliances could be approved without consideration of the toxic metals and other pollutants found in coal.

What will the Borough approve next?

Decker Titan 1, a 230,000 BTU auger-fed coal boiler also sold by North Pole Coal, may be next. If 2012-09 is approved as proposed, Borough staff will have broad leeway to use what testing procedure they believe is appropriate.

In February 2012, the Borough received its first inquiry to request a variance from the APCC for the lot size requirements in code. The inquiry is for a property along Chena Pump where the resident is considering installing a Titan 2. Current code prohibits installation of a hydronic heater on lots less than 80,000 square feet unless the person receives a variance from the Air Pollution Control Commission, see [FNSB Code 8.21.020 B. 2](#). Ironically, the APCC was not informed about Titan 2's approval and now are in the position of ruling on variances to install Titan 2 on smaller lots, with less setback, and for shorter chimneys.

OMNI tested two appliances with the [ClearStak CS-100 catalyst](#). According to Sierra Research, the results were of no value, because the air control system was not connected or operated during either test, [Sierra Research Critique, p 1 and 6](#). Even though the need for approval of these devices was discussed at length at the APCC hearing, there is no need for these appliances to be approved. Borough code has no prohibition of the addition of these afterburners. The only possible reason to approve them is for the purchase and installation to be covered by change-out funds. However, this is not needed, since Representative Tammie Wilson secured \$500,000 in state funding for the purchase, installation, and maintenance of these devices. At a cost of about \$2,500 each, and with only about 140 hydronic heaters in the nonattainment area, change-out funds should not be expended on the catalysts.

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Polluting is a choice; breathing is not.