AP42 Section:	11.19.1
Reference:	6
Title:	Written communication from R. Morris, National Aggregates Association, Silver Spring, MD, to R. Myers, U. S. Environmental Protection Agency, Research Triangle Park, NC, December 30, 1994.

AP-42 Section 11.19.1
Reference 6
Report Sect. ____
Reference ____

NATIONAL AGGREGATES ASSOCIATION

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December 30, 1994

Mr. Ronald E. Meyers
Emission Factor and Inventory Group
Emissions Monitoring and Analysis Division
Office of Air Quality Planning and Standards
U.S. Environmental Protection Agency
Research Triangle Park, NC 27711

Dear Mr. Meyers:

Rick Meininger has passed on to me the revised draft and associated report relative to the Sand and Gravel Processing Section (11.19.1) of the Compilation of Air Pollutant Emission Factors handbook, AP-42. The comments below are the result of several staff members' review including collaboration by Rick and me. We appreciate the opportunity to provide our comments on behalf of the National Aggregates Association (NAA).

As you may or may not recall, NAA (then known as the National Sand and Gravel Association) was heavily involved with your office in the early 1980's, with regard to updating AP-42 relative to the sand and gravel emission factors. Data was compiled in conjunction with EPA and EPA-approved test protocols. Much has occurred since then, in particular further testing and updating of the crushed stone emission factors which were previously revised in the 1980's in conjunction with the sand and gravel emission factors.

We agree with and appreciate the draft recommendation that absent new data, the emission factors presented in Section 11.19.2, crushed stone processing, should be used to estimate emissions from similar sources at sand and gravel operations . For a variety of reasons, the sand and gravel emission factors have historically been lower than the corresponding factors in the crushed stone industry. This is probably due to wet processing, a higher surface moisture content on aggregate products, and less intensive processing. Since new data from tests accepted by EPA have resulted in a significant lowering of crushed stone emission factors to a point below the current sand and gravel emission factors, it is appropriate that the Agency suggest the more recent crushed stone factors be used until new data is available with specific application to the sand and gravel industry. While we are seeking submission of test data that may have been undertaken in the last several years, we are not at this time aware of any new data following our mutual efforts during the 1980's, which are reflected in the current AP-42 sand and gravel processing section.

We also feel that it is very appropriate that the draft specifically not recommend emission factors from industrial sand operations as surrogates for construction sand and gravel processing, since the industrial sand emission factors are from dried sands and are likely to result in over estimating emissions from sand and gravel processing.

As a matter of fact, we believe that, generally speaking, there is such a difference between construction sand and gravel processing and industrial sand processing that they should not be included together in one AP-42 section. It would be better and make more sense, if the two industries had there own AP-42 sections. Page 2-1 of the MRI Report incorrectly states that there is no distinction between construction and industrial sand and gravel according to the federal government's Standard Industrial Classification (SIC), the most recent of which was published in 1987. I am enclosing excerpts from the 1987 SIC Manual relative to major group 14 -- Mining and Quarrying of Nonmetallic Minerals, Except Fuels. This is a broad group which includes, in addition to construction and industrial sand and gravel: crushed and dimension stone; clay; ceramic and refractory minerals; phosphate; pot ash; and perhaps 75 additional nonmetallic minerals. Paragraph 2 of page 2-1 in the MRI Report is just plain incorrect in asserting that sand and gravel are the only industries classified under SIC code 1440. As you can see from the enclosed excerpts, construction sand and gravel has its own SIC code which is 1442 and industrial sand has its own SIC code which is 1446. We believe that keeping this distinction is important for the sake of accuracy and to minimize unnecessary confusion.

The process flow diagram for construction sand and gravel processing (Figure 2-1 on page 2-11 of the draft MRI Report and repeated as Figure 11.19.1-1 in the proposed AP-42 section) would be more appropriate as a guide for a typical sand and gravel operation if it somehow indicated, as does the text, that many typical operations do no crushing. Also, it should be indicated on the flow diagram that fine screening and/or rodmilling is rarely done in construction sand and gravel operations. Grading of sand products is almost universally done using wet methods of hydraulic classification. The discussion of control technology on page 2-15 of the MRI Report, while presenting a caveat, gives the impression that the use of cyclones, wet scrubbers, venturi scrubbers, and fabric filters are more common at sand and gravel facilities than is the case.

The process flow diagram for construction sand and gravel processing (Figure 11.19.1-1 on page 11.19.1-2 of the draft AP-42 section on sand and gravel processing) has the same problems alluded to above for the first process flow diagram. We believe that the third paragraph of page 11.19.1-3 of the draft with reference of rodmilling to produce smaller size fractions, should be written as to indicate rodmilling takes place in only a very small percentage of sand and gravel facilities. For your convenience I am enclosing a marked up copy of AP-42 proposed Section 11.19.1 by Rick Meininger. It includes some editorial corrections, minor revisions, and suggested modifications to better characterize the construction sand and gravel industry.

We, of course, wish there were more acceptable data directly from sand and gravel operations from which reliable AP-42 emission factors could be based. While we have limited staff and financial resources, NAA is willing to cooperate with EPA to assist in coordination of studies that will provide more up-to-date and accurate assessments of representative data from sand and gravel operations, if so desired by the Agency.

Generally speaking, we again want to reiterate that, given the limited data available, the Agency has done a good job in making the practical assessment that the recently revised stone data can be used in the interim to estimate emissions from corresponding sand and gravel sources. We thank you again for the opportunity to review the aforementioned draft and would be pleased to cooperate with your office in any way appropriate.

Sincerely,

Richard A. Morris

Richard A. Morris
Vice President of Government
Relations and Public Affairs

RAM/dep

Enclosures

cc: Richard C. Meininger, NAA Vice President of Research

Major Group 14.—MINING AND QUARRYING OF NONMETALLIC MINERALS, EXCEPT FUELS

The Major Group as a Whole

This major group includes establishments primarily engaged in mining or quarrying, developing mines, or exploring for nonmetallic minerals, except fuels. Also included are certain well and brine operations, and primary preparation plants, such as those engaged in crushing, grinding, washing, or other concentration.

Establishments primarily engaged in manufacturing cement are classified in Industry 3241; those engaged in manufacturing lime are classified in Industry 3274; those engaged in cutting and finishing stone and stone products are classified in Industry 3281; and those engaged in manufacturing brick and other structural clay products are classified in Industry Group 325.

Establishments primarily engaged in crushing, pulverizing, or otherwise treating earths, rocks, and minerals mined in Industry Group 145 or 149; or barite mined in Industry 1479, not in conjunction with mining or quarrying operations, are classified in Manufacturing, Industry 3295; establishments primarily engaged in these activities in conjunction with mines or quarries are classified in Mining. Establishments primarily engaged in crushing, pulverizing, or otherwise treating other nonmetallic minerals are classified in Mining, whether or not they are operated in conjunction with mines.

Establishments primarily engaged in manufacturing other stone, clay, glass, and concrete products from minerals mined at the same establishment are classified in Manufacturing, Major Group 32, when separate reports are not available for the mining and manufacturing activities.

Industry Group No.	Industry No.	
141		DIMENSION STONE
	1411	Dimension Stone

Establishments primarily engaged in mining or quarrying dimension stone. Also included are establishments engaged in producing rough blocks and slabs. Establishments primarily engaged in mining dimension soapstone or in mining or quarrying and shaping grindstones, pulpstones, millstones, burrstones, and sharpening stones are classified in Industry 1499. Establishments primarily engaged in dressing (shaping, polishing, or otherwise finishing) blocks and slabs are classified in Manufacturing, Industry 3281. Nepheline syenite mining operations are classified in Industry 1459.

Argillite, dimension—quarrying
Basalt, dimension—quarrying
Bluestone, dimension—quarrying
Calcareous tufa, dimension—quarrying
Diabase, dimension—quarrying
Diorite, dimension—quarrying
Dolomite, dimension—quarrying
Dolomitic marble, dimension—quarrying
Flagstone mining
Gabbro, dimension—quarrying
Gneiss, dimension—quarrying
Granite, dimension—quarrying
Greenstone, dimension—quarrying
Limestone, dimension—quarrying
Marble, dimension—quarrying
Mica schist, dimension—quarrying
Onyx marble, dimension—quarrying
Quartzite, dimension—quarrying
Rubble mining
Sandstone, dimension—quarrying
Serpentine, dimension—quarrying
Slate, dimension—quarrying
Syenite (except nepheline), dimension—quarrying
Trap rock, dimension—quarrying
Travertine, dimension—quarrying
Verde' antique, dimension—quarrying
Volcanic rock, dimension—quarrying

Industry Group No. | Industry No.

142 CRUSHED AND BROKEN STONE, INCLUDING RIPRAP

1422 Crushed and Broken Limestone

Establishments primarily engaged in mining or quarrying crushed and broken limestone, including related rocks, such as dolomite, cement rock, marl, travertine, and calcareous tufa. Also included are establishments primarily engaged in the grinding or pulverizing of limestone, but establishments primarily engaged in producing lime are classified in Manufacturing, Industry 3274.

Calcareous tufa, crushed and broken—quarrying
Cement rock, crushed and broken—quarrying
Chalk mining, crushed and broken—quarrying
Dolomite, crushed and broken—quarrying
Lime rock, ground
Limestone, except bituminous: crushed and broken—quarrying
Marl, crushed and broken—quarrying
Travertine, crushed and broken—quarrying
Whiting mining, crushed and broken—quarrying

1423 Crushed and Broken Granite

Establishments primarily engaged in mining or quarrying crushed and broken granite, including related rocks, such as gneiss, syenite, and diorite.

Diorite, crushed and broken—quarrying
Gneiss, crushed and broken—quarrying
Granite, crushed and broken—quarrying
Syenite, except nepheline: crushed and broken—quarrying

1429 Crushed and Broken Stone, Not Elsewhere Classified

Establishments primarily engaged in mining or quarrying crushed and broken stone, not elsewhere classified.

Basalt, crushed and broken—quarrying
Boulder, crushed and broken—quarrying
Diabase, crushed and broken—quarrying
Dolomitic marble, crushed and broken—quarrying
Gabbro, crushed and broken—quarrying
Ganister, crushed and broken—quarrying
Grits mining (crushed stone)
Marble, crushed and broken—quarrying
Mica schist, crushed and broken—quarrying
Onyx marble, crushed and broken—quarrying
Quartzite, crushed and broken—quarrying
Riprap quarrying, except limestone or granite
Sandstone, except bituminous: crushed and broken—quarrying
Serpentine, crushed and broken—quarrying
Slate, crushed and broken—quarrying
Trap rock, crushed and broken—quarrying
Verde' antique, crushed and broken—quarrying
Volcanic rock, crushed and broken—quarrying

144 SAND AND GRAVEL

1442 Construction Sand and Gravel

Establishments primarily engaged in operating sand and gravel pits and dredges, and in washing, screening, or otherwise preparing sand and gravel for construction uses.

Common sand mining
Construction sand mining
Gravel mining
Pebble mining

Industry Group No. | Industry No.

144 **SAND AND GRAVEL—Con.**

1446 Industrial Sand

Establishments primarily engaged in operating sand pits and dredges, and in washing, screening, and otherwise preparing sand for uses other than construction, such as glassmaking, molding, and abrasives.

- Abrasive sand mining
- Blast sand mining
- Enamel sand mining
- Filtration sand mining
- Foundry sand mining
- Glass sand mining
- Grinding sand mining
- Industrial sand mining
- Molding sand mining
- Silica mining
- Silica sand mining

145 **CLAY, CERAMIC, AND REFRACTORY MINERALS**

Establishments primarily engaged in mining, milling, or otherwise preparing clays and refractory minerals. Mines operated in conjunction with plants manufacturing cement, brick or other structural clay products, or pottery and related products, are included in this industry when separate reports are available. Establishments primarily engaged in grinding, pulverizing, or otherwise treating clay, ceramic, and refractory minerals not in conjunction with mining or quarrying operations are classified in Manufacturing, Industry 3295.

1455 Kaolin and Ball Clay

Establishments primarily engaged in mining, milling, or otherwise preparing kaolin or ball clay, including china clay, paper clay, and slip clay.

- Ball clay mining
- China clay mining
- Kaolin mining
- Paper clay mining
- Rubber clay mining
- Slip clay mining

1459 Clay, Ceramic, and Refractory Minerals, Not Elsewhere Classified

Establishments primarily engaged in mining, milling, or otherwise preparing clay, ceramic, or refractory minerals, not elsewhere classified. Establishments producing clay in conjunction with the manufacture of refractory or structural clay and pottery products are classified in Manufacturing, Major Group 32.

- Andalusite mining
- Aplite mining
- Bentonite mining
- Brucite mining
- Burley mining
- Clays (common) quarrying—not in conjunction with manufacturing
- Cornwall stone mining
- Cyanite mining
- Diaspore mining
- Dumortierite mining
- Feldspar mining
- Fire clay mining
- Flint clay mining
- Fuller's earth mining
- Kyanite mining
- Magnesite mining
- Nepheline syenite quarrying
- Olivine (nongem) mining
- Pegmatite (feldspar) mining
- Pinite mining
- Plastic fire clay mining
- Shale (common) quarrying-not in conjunction with manufacturing
- Sillimanite mining
- Stoneware clay mining
- Syenite, nepheline—quarrying
- Topaz (nongem) mining

147 **CHEMICAL AND FERTILIZER MINERAL MINING**

1474 Potash, Soda, and Borate Minerals

Establishments primarily engaged in mining, milling, or otherwise preparing natural potassium, sodium, or boron compounds. Establishments primarily engaged in mining common salt are classified in Industry 1479.

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF MANAGEMENT AND BUDGET

STANDARD INDUSTRIAL CLASSIFICATION MANUAL

1987

Marked up by R.C. Meininger, NAA 12-29-94

11.19.1 SAND AND GRAVEL PROCESSING

11.19.1.1 Process Description[1-5]

Deposits of sand and gravel, the unconsolidated granular materials resulting from the natural disintegration of rock or stone, are generally found in near-surface alluvial deposits and in subterranean and subaqueous beds. Sand and gravel are products of the weathering of rocks and unconsolidated or poorly consolidated materials and consist of siliceous and calcareous components. Such deposits are common throughout the country. The six-digit Source Classification Code (SCC) for sand and gravel processing is 3-05-025.

Construction Sand and Gravel

Sand and gravel typically are mined in a moist or wet condition by open pit excavation or by dredging. Open pit excavation is carried out with power shovels, draglines, front end loaders, bucket wheel excavators, and delete ~~and belt conveyors~~ In rare situations, light charge blasting is done to loosen the deposit. Mining by dredging involves mounting the equipment on boats or barges and removing the sand and gravel from the bottom of the body of water by suction or bucket-type dredges. After mining, the materials are transported to the processing plant by suction pump, earth mover, barge, truck, or other means.

Although significant amounts of sand and gravel are used for fill (, bedding, subbase, and base course) without processing, most domestic sand and gravel is processed prior to use. The processing of sand and gravel for a specific market involves the use of different combinations of washers, screens, and classifiers to segregate particle sizes; crushers to reduce oversized material; and storage and loading facilities. A process flow diagram for construction sand and gravel processing is presented in Figure 11.19.1-1. The following paragraphs describe the process in more detail.

After being transported to the processing plant, the wet sand and gravel raw feed is stockpiled or emptied directly into a hopper, which typically is covered with a "grizzly" of parallel bars to screen out large Cobbles and boulders. From the hopper, the material is transported to fixed or vibrating scalping screens by belt, gravity, hydraulic pump, or bucket elevators. The scalping screens separate the oversize material from the smaller delete ~~marketable~~ sizes. The oversize material may be directed to a crusher for size reduction, to produce

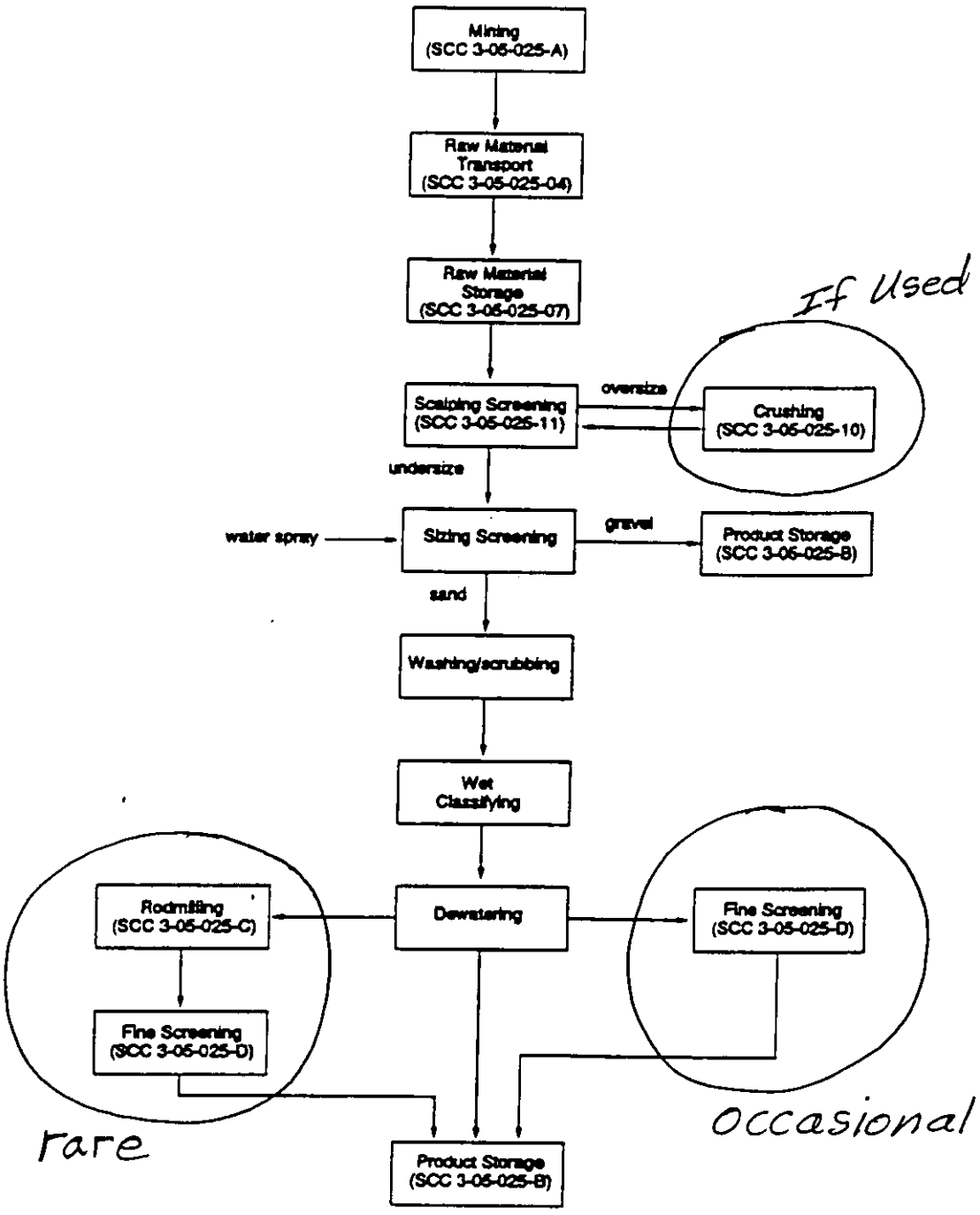

Figure 11.19.1-1. Process flow diagram for construction sand and gravel processing. (Source Classification Codes in parentheses.)

crushed ... manufactured

angular shaped aggregate, or to produce the finer sizes of sands. Crushing generally is carried out in one or two stages, although three-stage crushing may also be performed. Following crushing, the material is returned to the screening operation for sizing. Alternatively, oversize may be kept seperate for use in erosion control work applications, reclamation or other uses.

The material that passes through the scalping screen is fed into a battery of sizing screens, which generally consist of horizontal or sloped, single or multideck vibrating screens. Screening separates the sand and gravel into different size ranges. Water is sprayed onto the material throughout the screening process. After screening, the sized gravel is transported to storage bins, or, stockpiles, in some cases, to crushers by belt conveyors, bucket elevators, or screw conveyors.

Rotating trommel screens with water sprays are also used To process and wash wet sand and gravel.

The sand is freed from clay and organic impurities by log washers or rotary scrubbers. After scrubbing, the sand is sized typically by water classification, although both wet and dry screening and air separation also are rarely used to size the sand. After classification, the sand is dewatered using screws, separatory cones or hydroseparators, followed by fine screening for grading. ~~The sand~~ Material may also be rodmilled occasionally to produce smaller sized fractions. After processing, the sand also is transported to storage bins by belt conveyors, bucket elevators, or screw conveyors. or stockpiles

delete ... delete

Industrial Sand and Gravel

Industrial sand and gravel typically is mined from open pits of naturally occurring quartz-rich sand and sandstone. Mining methods depend primarily on the degree of cementation of the rock. In some deposits, blasting is required to loosen the material prior to processing. The material may undergo primary crushing at the mine site before being transported to the processing plant. Figure 11.19.1-2 is a flow diagram for industrial sand and gravel processing.

The mined rock is transported to the processing site and stockpiled. The material then is crushed. Depending on the degree of cementation, several stages of crushing may be required to achieve the desired size reduction. Gyratory crushers, jaw crushers, roll crushers, and impact mills are used for primary and secondary crushing. After crushing, the size of the material is further reduced by grinding using smooth rolls, media mills, autogenous mills, hammer mills, or jet mills, to 50 micrometers (μm) or smaller. The ground material then is classified by wet screening, dry screening, or air classification. At some plants, after initial crushing and screening, a portion of the sand may be diverted to construction sand use.

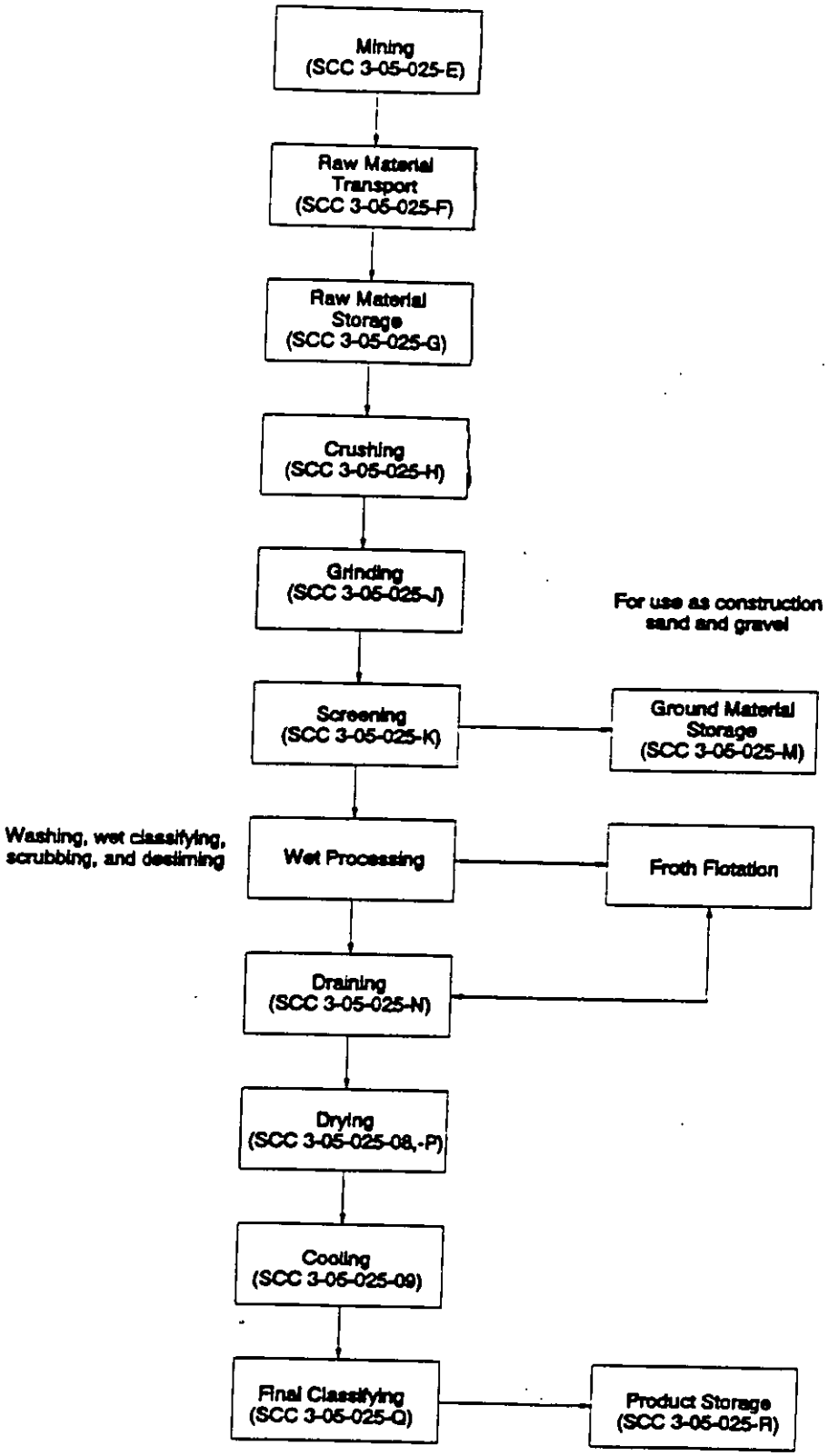

Figure 11.19.1-2. Process flow diagram for industrial sand and gravel processing. (Source Classification Codes in parentheses.)

After initial crushing and screening, industrial sand and gravel are washed to remove unwanted dust and debris, and screened and classified again. The sand (now containing 25 to 30 percent moisture) or gravel then goes to an attrition scrubbing system that removes surface stains from the material by rubbing in an agitated, high density pulp. The scrubbed sand or gravel is diluted with water to 25 to 30 percent solids and pumped to a set of cyclones for further desliming. If the deslimed sand or gravel contains mica, feldspar, and iron bearing minerals, it enters a froth flotation process where sodium silicate and sulfuric acid are added. The mixture then enters a series of spiral classifiers where the impurities are floated in a froth product and diverted to waste. The flotation product, which has a moisture content of 15 to 25 percent, is conveyed to drainage bins where the moisture content is reduced to about 6 percent. The material is then dried to a moisture content of less than 0.5 percent in rotary or fluidized bed dryers. The dryers generally are fired with natural gas or oil, although other fuels such as propane or diesel also may be used. After drying, the material is cooled and then undergoes final screening and classification prior to being stored and packaged for shipment.

11.19.1.2 Emissions and Controls[6-13]

Emissions from the production of sand and gravel consist primarily of particulate matter (PM) and particulate matter less than 10 micrometers (PM-10) in aerodynamic diameter, that are emitted by many operations at sand and gravel processing plants, such as conveying, screening, crushing, and storing operations. Generally, these materials are wet or moist when handled, and process emissions are often negligible. A substantial portion of these emissions may consist of heavy particles that settle out within the plant. Other potentially significant sources of PM and PM-10 emissions are haul roads. Emissions from dryers include PM and PM-10, as well as typical combustion products including CO, CO_2, and NO_x. In addition, dryers may be sources of volatile organic compounds (VOC) or sulfur oxides (SO_x) emissions depending on the type of fuel used to fire the dryer.

With the exception of drying, emissions from sand and gravel operations primarily are in the form of fugitive dust, and control techniques applicable to fugitive dust sources are appropriate. Some successful control techniques used for haul roads are application of dust suppressants, paving, route modifications, and soil stabilization; for conveyors, covering and wet suppression; for storage piles, wet suppression, windbreaks, enclosure and soil stabilizers; and for conveyor and batch transfer points, wet suppression and various methods to reduce freefall distances (e. g., telescopic chutes,

stone ladders, and hinged boom stacker conveyors); for screening and other size classification, covering and wet suppression.

Wet suppression techniques include application of water, chemicals and/or foam, usually at crusher or conveyor feed and/or discharge points. Such spray systems at transfer points and on material handling operations have been estimated to reduce emissions 70 to 95 percent. Spray systems can also reduce loading and wind erosion emissions from storage piles of various materials 80 to 90 percent. Control efficiencies depend upon local climatic conditions, source properties and duration of control effectiveness. Wet suppression has a carryover effect downstream of the point of application of water or other wetting agents, as long as the surface moisture content is high enough to cause the fines to adhere to the larger rock particles.

In addition to fugitive dust control techniques, some facilities use add-on control devices to reduce emissions of PM and PM-10 from sand and gravel processing operations. Controls in use include cyclones, wet scrubbers, venturi scrubbers, and fabric filters. Use of these types of controls is more common at industrial sand processing facilities than at other sand and gravel processing plants.

Emission factors for criteria pollutant emissions from industrial sand and gravel processing are presented in Table 11.19.1-1 (metric and English units), and emission factors for organic pollutant emissions from industrial sand and gravel processing are presented in Table 11.19.1-2 (metric and English units). Although no emission factors are presented for construction sand and gravel processing, emission factors for the crushing, screening, and handling and transfer operations associated with stone crushing can be found in Section 11.19.2 of AP-42. In the absence of other data, the emission factors presented in Section 11.19.2 can be used to estimate emissions from corresponding sand and gravel processing sources. The background report for this AP-42 section also presents factors for the combined emissions of total suspended particulate from construction gravel storage pile wind erosion, material handling, and vehicle traffic. However, because the applicability of those emission factors to other storage piles is questionable, they are not presented in this AP-42 section. The emission factors for industrial sand storage and screening presented in Table 11.19.1-1 are not recommended as surrogates for construction sand and gravel processing because they are based on emissions from dried sand and may result in overestimates of emissions from those sources.

Consideration must be given to the moisture on the materials. Usually construction sand and gravel is maintained in a wet condition during processing.

Draft Table 11.19.1-1 (Metric and English Units).
EMISSION FACTORS FOR INDUSTRIAL SAND AND GRAVEL PROCESSING[a]

EMISSION FACTOR RATING: D

Source	Filterable PM[b]		NO_x		CO_2	
	kg/Mg	lb/ton	kg/Mg	lb/ton	kg/Mg	lb/ton
Sand dryer (SCC 3-05-025-08)	0.98[c]	2.0[c]	0.016[d]	0.031[d]	14[e]	27[e]
Sand dryer with wet scrubber (SCC 3-05-025-08)	0.019[f]	0.039[f]	g	g	g	g
Sand dryer with fabric filter (SCC 3-05-025-08)	0.0053[h]	0.010[h]	g	g	g	g
Sand handling, transfer, and storage with wet scrubber (SCC 3-05-025-R)	0.00064[j]	0.0013[j]	ND	ND	ND	ND
Sand screening with venturi scrubber (SCC 3-05-025-Q)	0.0042[k]	0.0083[k]	ND	ND	ND	ND

[a]Factors represent uncontrolled emissions unless noted. SCC = Source Classification Code. Dryer emission factors in units of kg/Mg and lb/ton of material dried; other factors in units of kg/Mg and lb/ton of material stored or screened.
[b]Filterable PM is that PM collected on or prior to the filter of an EPA Method 5 (or equivalent) sampling train.
[c]Reference 11. EMISSION FACTOR RATING: E.
[d]Reference 9.
[e]References 9,12.
[f]References 5,12. EMISSION FACTOR RATING: C.
[g]Control device has no effect on emissions. See factor for uncontrolled emissions.
[h]References 6,10.
[j]Reference 8. For dried sand.
[k]Reference 13. Screening of dried sand.

Draft Table 11.19.1-2 (Metric And English Units).
EMISSION FACTORS FOR INDUSTRIAL SAND AND GRAVEL PROCESSING–
ORGANIC POLLUTANTS[a]

EMISSION FACTOR RATING: D

Source	Pollutant		Emission factor	
	CASRN[b]	Name	kg/Mg	lb/ton
Diesel-fired sand dryer with fabric filter (SCC 3-05-025-p)	50-00-0	Formaldehyde	0.0021	0.0043
	206-44-0	Fluoranthene	3.0×10^{-6}	6.0×10^{-6}
	91-20-3	Naphthalene	2.9×10^{-5}	5.9×10^{-5}
	85-01-8	Phenanthrene	7.5×10^{-6}	1.5×10^{-5}

[a]Factors represent uncontrolled emissions unless noted. SCC = Source Classification Code. Dryer emission factors in units of kg/Mg and lb/ton of material dried. Reference 7.
[b]Chemical Abstract Service Registry Number.

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