



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101

September 30, 1993

Reply to
Attn of: ES-097

MEMORANDUM

SUBJECT: Additional Information Related to Model Clearinghouse
Review of Building Wake Effects on Volume Sources

FROM: Rob Wilson, Regional Meteorologist *Rob*
Bill Ryan, Environmental Engineer *Bill*

TO: Dean Wilson
Source Receptor Analysis Branch, OAQPS (MD-14)

At your request, we are providing additional information related to the proposed methodology for evaluating building wake effects on volume sources in the development of the PM₁₀ Tribal Implementation Plan in Pocatello, Idaho. By way of this memo, we are also providing a corrected version of the methodology. Recent discussions with Russ Lee have revealed a typographical error in the methodology contained in our original request for Clearinghouse concurrence (see our May 18, 1993 memo to Joe Tikvart).

As an example of the potential for building wake effects on a volume source, Figure 1 depicts the source/building configuration for the slag pit (outlined in blue) and nearby buildings (outlined in red) at the FMC facility. The slag pit is at or below grade immediately adjacent to the furnace building and is approximately 122 meters (m) long (east-west dimension) and 50 m wide (north-south dimension). The furnace building (B1) is located to the north of the slag pit and is roughly 135 m long, 30 m wide, and 34 m high. The Briquetting Building (B6) is located to the east of the slag pit and is roughly 45 m long by 45 m wide and about 24 m in height.

In addition, the criteria contained in Table 1 for specifying initial volume source plume dimensions are proposed to supplement criteria contained in Table 1-6 of Volume II of the ISC2 User's Guide. Note that the guidelines contained in Table 1 correct a typographical error contained in our May 18, 1993 memo.

Should you have any further questions, please contact either one of us.

FIGURE 1

FMC SLAG PIT & NEARBY BLDGS.

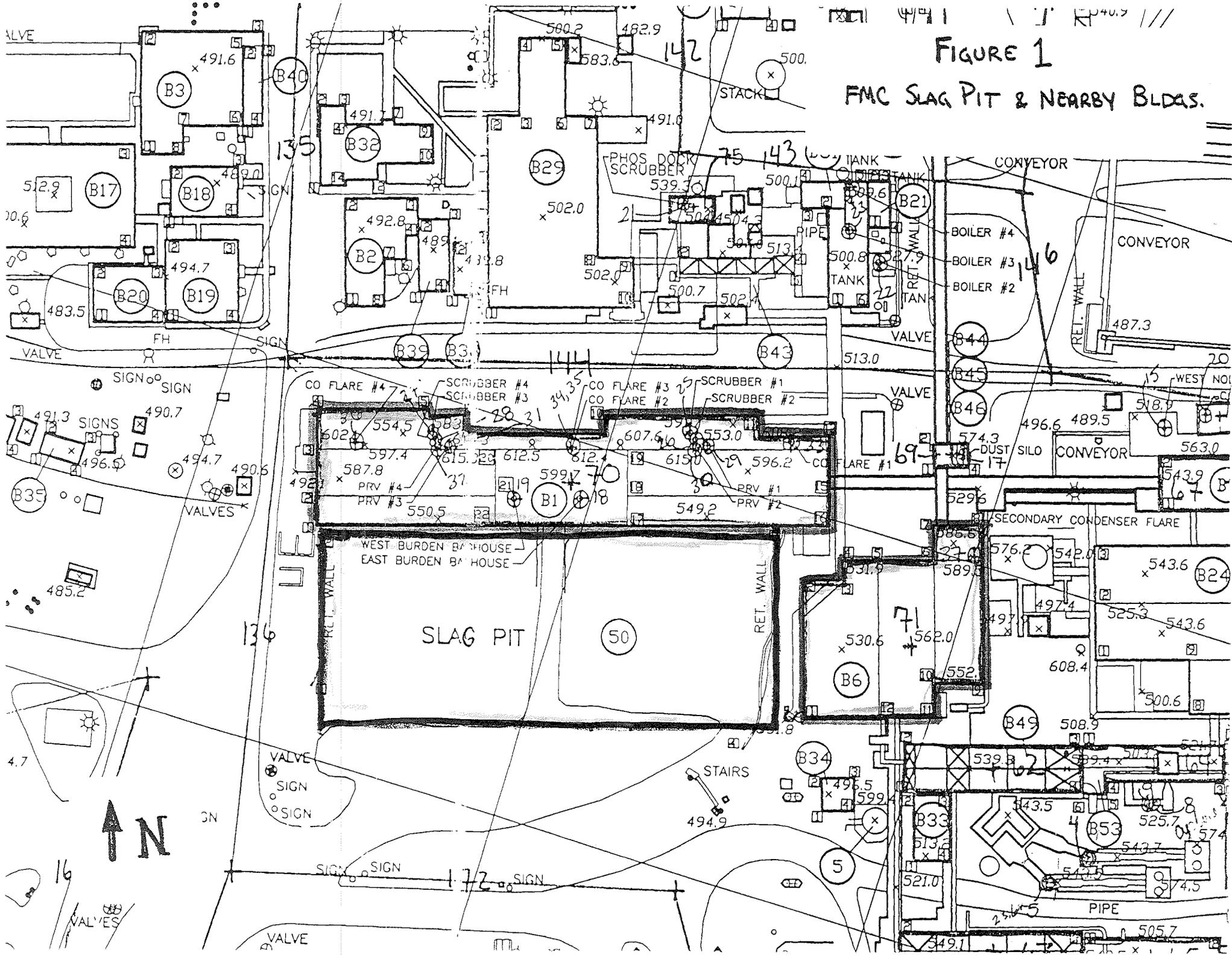


Table 1

Supplement to Table 1-6, Volume II, ISC2 User's Guide
for Defining Initial Volume Source Plume Dimensions

Parameter to Define	Source Type	Recommended Procedure
σ_{y0}	Volume source on or adjacent to a building	If $L_s \geq L_b$ $\sigma_{y0} = L_s/4.3$ If $0.7 L_b < L_s < 1.0 L_b$ $\sigma_{y0} = L_b/4.3$ If $L_s \leq 0.7 L_b$ $\sigma_{y0} = L_b/4.3$ or $\sigma_{y0} = 5.0 L_s/4.3$ (whichever is less)
σ_{z0}	Ground-level or elevated volume source adjacent to a building	If $H_s \geq H_b$ $\sigma_{z0} = H_s/2.15$ If $0.7 H_b < H_s < 1.0 H_b$ $\sigma_{z0} = H_b/2.15$ If $H_s \leq 0.7 H_b$ $\sigma_{z0} = H_b/2.15$ or $\sigma_{z0} = 5.0 H_s/2.15$ (whichever is less)

Note: L_s = lateral dimension of source
 H_s = vertical dimension of source
 L_b = projected lateral dimension of building
 H_b = height of building