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Memorandum

ATTORNEY CLIENT PRIVILEGED
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To:

From:

cc:

Date: February 13, 2001

Re: Compliance of Lexington County and City of Cayce Resolutions with the National Flood Insurance Act, as Amended, and the National Flood Insurance Program Regulations

We have been asked by Columbia Venture, LLC ("Columbia Venture") to address whether the resolutions adopted by Lexington County Council and the City of Cayce, supporting the adoption of the Congaree River regulatory floodway in accordance with the HEC-2 BFE Lexington model, are consistent with the National Flood Insurance Act, as amended (the "Act"), and the National Flood Insurance Program ("NFIP") regulations.

I. FACTUAL AND PROCEDURAL BACKGROUND

On September 26, 2000, FEMA issued an Appeal Resolution for Richland and Lexington Counties, South Carolina (the "Appeal Resolution"), which included proposed final Flood Insurance Studies ("FISs") and Flood Insurance Rate Maps ("FIRMs") for the areas adjacent to the Congaree River and south of Columbia, South Carolina. The Appeal Resolution is the result of an administrative appeal brought by three parties challenging the revised

[REDACTED]
February 13, 2001

Page 2

preliminary FISs and FIRMs which FEMA issued on August 12, 1999.¹ The August 12, 1999 map was based, in part, on the assumption that no effective flow would occur landward of Manning's dike on the Richland County side of the river (i.e., no levee breach).

The revised map, as delineated in and incorporated in the Appeal Resolution, significantly expands the Congaree River floodway based on the assumption that the levee would breach (i.e., levee removal) and that floodwaters would convey landward of Manning's dike. As a result, 70 percent of the property owned by Columbia Venture and slated for development are now within the proposed boundaries of the expanded floodway. FEMA indicated, upon its release, that it would provide a 30 day period during which it would accept public comments on the Appeal Resolution. FEMA subsequently extended the public comment period until January 2, 2001, with additional technical data accepted until February 15, 2001. FEMA will consider all information received between September 26, 2000 and February 15, 2001 before issuing a Letter of Final Determination ("LFD"). The LFD is expected to be issued on or around March 15, 2001.

A. The Regulatory Construct for Designating A Regulatory Floodway

Under the Act and the NFIP regulations, FEMA does not establish federal floodplain management plans for flood-prone communities. Rather, the Administrator of the NFIP is charged with developing criteria, based on the best available science and most technically correct data, with which a community-based floodplain management plan must

¹ Under 42 U.S.C. § 4101(c) and (d), the Director of FEMA is charged with assessing the need for a revised floodplain area once every 5 years. Until a final determination of the floodplain revision is made by FEMA, the last-issued 1995 map, which includes little of Columbia Venture's property within the delineated floodplain, remains in force. See 42 U.S.C. § 4104(e) (declaring that pending final determination of a floodplain revision, "flood insurance previously available within the community shall continue to be available").

February 13, 2001

Page 3

comply in order for the community to become and/or remain eligible for federal flood insurance.² Both the Act and the NFIP regulations contemplate that a community may adopt more stringent floodplain management regulations than those set forth in the NFIP regulations.³

The floodplain management criteria for flood-prone areas are set forth in 44 C.F.R. § 60.3, which provide in relevant part:

The Administrator will provide the data upon which flood plain management criteria shall be based . . . when special flood hazard area designations and water surface elevations have been furnished by the Administrator, they shall apply.

Id. Central to the NFIP regulations is the notion that the affected communities will, themselves, have an important role in determining the final floodplain management regulations and the regulatory floodway boundaries. See generally 44 C.F.R. Part 66. In addition, 44 C.F.R. § 60.3(d) provides in relevant part:

² The NFIP regulations specifically provide:

. . . flood insurance shall not be sold or reviewed under the program, unless the community has adopted adequate floodplain management regulations consistent with federal criteria. Responsibility for establishing such criteria is delegated to the [NFIP] Administrator.

44 C.F.R. § 60.1(a). (Emphasis added).

³ The regulations provide in relevant part:

The criteria set forth in this subpart are minimum standards for the adoption of floodplain management regulations by flood prone . . . communities. Any community may exceed the minimum criteria under this part by adopting more comprehensive floodplain management regulations.

44 C.F.R. § 60.1(d). (Emphasis added). The Act and the NFIP regulations further contemplate that FEMA shall actively consult with community officials in developing the technical criteria upon which a community floodplain management plans shall be based. See generally, 44 C.F.R. Part 66 (Consultation with Local Officials).

When the Administrator has provided a notice of final base flood elevations . . . and has provided data from which the community shall designate its regulatory floodway, the community shall:

(2) Select and adopt a regulatory floodway based on the principle that the area chosen for the regulatory floodway must be designed to carry the waters of the base flood, without increasing the water surface elevations of that flood more than one foot at any point[.]

44 C.F.R. § 60.3(d)(2) (emphasis added). The NFIP floodplain management criteria further provide that, once the regulatory floodway is adopted, the affected community shall:

(3) prohibit encroachments, including fill, new construction, substantial improvements, and other development within the adopted regulatory floodway, unless it has been demonstrated through hydrologic and hydraulic analyses performed in accordance with standard engineering practice, that the proposed encroachment would not result in any increase in flood levels within the community during the occurrence of the base flood discharge[.]

44 C.F.R. § 60.3(d)(3).

The NFIP regulations define the "regulatory floodway" as the "channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height." 44 C.F.R. § 59.1. Thus, read in conjunction with 44 C.F.R. § 60.3(d)(2), an affected community shall select and adopt a regulatory floodway designed to carry the waters of a "base flood,"⁴ without increasing the water surface elevation of such flood "more than one foot at any point." 44 C.F.R. § 60.3(d)(2).

⁴ A "base flood" is defined as a flood "having a percent chance of being equaled or exceeded in any given year," i.e., a "100 year flood." See 44 C.F.R. § 59.1.

B. The Proposed September 26, 2000 Map

In the proposed FIRM incorporated in the Appeal Resolution, FEMA used one HEC-2 calculation for establishing the Lexington County base flood elevation ("BFE") based on the assumption no levee breach would occur, and a separate HEC-2 calculation for establishing the Richland County BFE based on levee removal in the event of a base flood. As explained in the Appeal Resolution:

Due to the width of the floodplain, the presence of unconfined dikes and multiple openings in Interstate 77, the lower Congaree River floodplain is difficult to model. These complexities were addressed by using two-dimensional steady flow model, which can determine water-surface elevation and velocity at any point in the floodplain. . . . This two-dimensional model was used to analyze flow patterns and conveyance landward of Manning's [dike]. This tool allowed [FEMA] to model a variety of likely dike failure scenarios during the base flood. The results showed that a significant amount of flow could be expected behind the breached dike during a 100-year flood.

In this situation, [FEMA] guidelines require that we show different BFEs landward of the breached dike than riverward of the dike. This is because the highest water-surface elevations in Lexington County will occur before the dike breaches, while water-surface elevations across the floodplain will be lowered after the dike breaches. The highest water-surface elevations in Richland County will occur after the dike breaches. BFEs landward of the dike are 1 to 2 feet lower than those riverward of the dike.

Appeal Resolution, at iii.

Because the two-dimensional model for establishing BFEs purported to demonstrate the likelihood of "significant conveyance of flow behind Manning's dike" in the event of a base flood, FEMA concluded that its guidelines "require that the floodway be

February 13, 2001

Page 6

computed using the equal conveyance reduction method.”⁵ Accordingly, FEMA used the Richland County equal conveyance reduction HEC-2 model to establish proposed regulatory floodways in both counties in the September 26, 2000 map. It is Columbia Venture’s position that the final determination of the regulatory flood may be resolved on the basis of the September 26 map, provided that the Lexington BFE HEC-2 model is used for calculating the Lexington County portion of the floodway. After review and consultation, the Lexington County Council unanimously adopted a resolution on November 14, 2000, transmitted to FEMA on November 21, 2000, supporting use of the Lexington BFE HEC-2 model for this purpose. On December 5, 2000, the City of Congaree adopted a resolution endorsing the same technical approach.

II. DISCUSSION

FEMA, itself, has acknowledged that modeling the Congaree River floodplain is difficult to model due to its width, the presence of uncertified dikes, and the multiple openings in Interstate 77. See Appeal Resolution, at iii. These complexities, however, can be best addressed by using a two-dimensional steady flow model, which can determine water-surface elevation and velocity at any point in the floodplain. Id. While, as set forth in the FEMA guidelines, it may be appropriate to use the equal conveyance reduction method to calculate the regulatory floodway on the Richland County side of the river due to the presence of the uncertified dikes and the separation of the two counties by the river, see "Flood Insurance Guideline and Specifications," FEMA Pub. 37, at 5-3, it would appear technically inappropriate, for several reasons, to use the

⁵ Appeal Resolution, at iii. "Equal conveyance reduction" assumes that an equal amount of the excess flow of base flood will be removed on either side of the river.

February 13, 2001

Page 7

equal conveyance reduction method for calculating the floodway on the Lexington County side of the river.

The guidelines instruct that the equal conveyance reduction method is the preferred method to calculate a regulatory floodway only "if it is technically appropriate." FEMA Pub. 37 at 5-2 - 5-4, 7-4 (emphasis added). In the present case, however, the proposed FIRM in the Appeal Resolution produces the anomalous result that, on the Lexington County side, the regulatory floodway is set below the level of the Lexington County BFE.⁶ Such a result would appear to be inconsistent with the FEMA guidelines that the "surcharge values should be between zero and the maximum allowable value (i.e., no more than one foot at any point).⁷ FEMA Pub. 37, at 5-3. Moreover, where, as here, "equal reduction of conveyance is not technically appropriate, or where unusual flow patterns are encountered, "FEMA" shall coordinate" with appropriate engineering consultants to select "the most appropriate engineering methods" for purposes of calculating the floodway. Id. See 5-3.

In a letter to the Mayor of the City of Cayce, dated February 12, 2001, Michael K. Buckley, Director of the Technical Services Division of FEMA's Mitigation Directorate, reiterated the rationale for proposing the floodway boundaries based on the equal conveyance reduction method.⁸ Tellingly, Mr. Buckley explained that, "[r]ather than focusing on the location

⁶ Under the HEC-2 Lexington County model, the Lexington BFE is, by example, calculated at 140 feet MSL. The regulatory floodway, using the Richland County ("equal conveyance") HEC-2 model, is, by example, set at 139 feet MSL for both Lexington and Richland counties -- one foot below the Lexington BFE.

⁷ The "surcharge" referenced in the FEMA guidelines is the allowed difference between the regulatory floodway elevation and the base flood elevation or BFE. See 44 C.F.R. 60.3(d)(2).

⁸ In his February 12, 2001 letter, Mr. Buckley explained:

February 13, 2001

Page 8

of the floodway limits, we feel it is most important for all potentially affected parties to carefully consider the effect on flood elevations, flow paths, and impacted property owners, of any proposal to restrict or eliminate flow landward of the Manning dike. Id. This rationale, however, misstates the point of the Lexington County and City of Cayce resolutions. These resolutions do not call for the reconfiguration of the Richland County floodway based on the restriction or elimination of flow landward of Manning's dike. Indeed, the point of the resolutions is to leave the boundaries of the Richland County portion of the floodway as they are currently represented on the September 26, 2000 map. Rather, these resolutions call only for the designation of that portion of the regulatory floodway on the Lexington County side of the river by using the Lexington BFE HEC-2 model in accordance with 44 C.F.R. § 60.3(d)(2). This would, of course, eliminate the unacceptable anomaly in the September 26, 2000 map, i.e., the delineation of the Lexington County portion of the regulatory floodway below the level of the Lexington BFE. Thus, Mr. Buckley's February 12, 2001 letter does not nullify the requirement that FEMA issue a Letter of Final Determination in accordance with the Lexington County Council and City of Cayce resolutions.

To determine the floodway configuration in areas affected by dikes and levees that do not meet NFIP accreditation criteria, an analysis is conducted that considers flow occurring both on the riverward and landward sides of the dike. This approach ensures that all areas that will possibly convey flow are kept free of encroachment and that the floodway is determined in the fairest way possible. This approach, which is documented in Chapter 7 of FEMA 37, was used by FEMA to determine the floodway for the Congaree River along the Manning dike. This means that the model used to determine the BFEs for the areas landward of the dike was also used to establish the floodway limits. As mentioned previously, a two-dimensional model of the subject area along the Congaree River suggests that flow is likely to occur landward of the Manning dike. Thus, the above-described approach for determining the floodway is sound.

Importantly, the FEMA Office of General Counsel has opined that there is no single "most correct floodway computation method." "Memorandum for Chief, Technological Hazards Division," dated September 20, 1989, FEMA GCM 89-9-20. As set forth in the memorandum, "[t]here is no current requirement that standards and procedures for computing the floodway be regulated . . . [T]he method chosen usually depends, in large part, upon who is contracted with to perform the work. Because various circumstances may warrant the use of various methods, [FEMA] need[s] to maintain some flexibility . . ." Id. In this case, the technical method ultimately selected should be designed to best ensure that the floodway will be able to carry the waters of a base flood without increasing the water surface elevation more than one foot any point, consistent with the regulatory requirements of 44 C.F.R. § 60.3(d)(2). The most technically correct and scientifically appropriate method for calculating the Lexington County portion of the regulatory floodway, in the circumstances presented here and as demonstrated above, is the Lexington BFE HEC-2 model.

III. CONCLUSION

It would thus appear that the Lexington County Council and the City of Cayce are entirely within their rights under the Act and the NFIP regulations to insist on a more stringent floodplain management program than the one contemplated in the Appeal Resolution, particularly, where, as here, the September 26, 2000 map would establish the computed floodway for Lexington County below the Lexington BFE. Importantly the Lexington and Cayce resolutions would not -- as erroneously suggested in Mr. Buckley's February 12, 2001 letter -- impact the floodway on the Richland County side of the river. That part of the floodway would continue to be based on the equal conveyance reduction method. Nor would it affect the calculation of the Richland County BFE, which would continue to be calculated on the basis of the same methodology.