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**June 4, 2019**

VIA EMAIL: Kelsey.lindquist@slcgov.com

Historic Landmark Commission  
SALT LAKE CITY CORPORATION  
451 South State Street, Room 326  
Salt Lake City, Utah 84111

Cc: Holly Mullen, Communications and Engagement Manager (holly.mullen@slcgov.com)

Re: 4<sup>th</sup> Avenue Well's Failure to Comply with Salt Lake Code Requirements  
Comment to Historic Land Commission ("HLC") on 4<sup>th</sup> Avenue Pump Applications by the Department of Public Utilities ("DPU") at approximately 200 North Canyon Road, Salt Lake City, Utah (the "Well")<sup>1</sup>. HLC PLNHLC2018-00557 and PLNHLC2018-00558

Sirs:

Salt Lake City Department of Public Utilities proposed Well at approximately 200 North Canyon Road in Salt Lake City fails to comply with Historic Overlay District factors of Salt Lake City Ordinance 21A.34.020-H-4(a)(1-3) regarding height, width and massing<sup>2</sup> and the Special Use Exceptions factors of Salt Lake City Ordinance 21A.52.060 *et seq.*, General standards.<sup>3</sup>

The proposed Well design does not comply with the above named standards because of a staff review process failure. SLC Ordinances 21A-34-010F(d)(13), "Materials Submitted With Application", requires that the application<sup>4</sup> include, "[a]ny further information or documentation as the Zoning Administrator deems necessary in order to fully consider and analyze the application." The site is subject to commonly known flooding and seismic hazards that will materially

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<sup>1</sup> Salt Lake City Department of Public Utilities. 2019. Information Website on 4<sup>th</sup> Avenue Well Project (url: <https://www.slc.gov/utilities/fourth-avenue-well-project/>, accessed May 2019).

<sup>2</sup> url: [https://www.sterlingcodifiers.com/codebook/getBookData.php?chapter\\_id=49078#s928576](https://www.sterlingcodifiers.com/codebook/getBookData.php?chapter_id=49078#s928576)  
) "Building Form and Scale . . . (1) Height: . . . (2) Width: . . . (3) Massing . . ." See Briefing Materials Attachment I for related staff conclusions on these factors.

<sup>3</sup> url:  
[https://www.sterlingcodifiers.com/codebook/getBookData.php?chapter\\_id=49087#s1122188](https://www.sterlingcodifiers.com/codebook/getBookData.php?chapter_id=49087#s1122188) .  
See Attachment J of the briefing materials for staff conclusions.

<sup>4</sup> See Attachment A of the briefing materials.

affect its future engineering design and approval by the Building Department pursuant to the International Building Code (IBC-2015). Detailed site-specific flood and seismic analysis is normally required in subsequent Building Department proceedings, but – as in the instant matter - where the hazards are obvious, an early site-specific flood and seismic analysis would have better defined the minimum height, width, mass and floor-above-grade requirements. No such analysis appears in the Commission's record. In this instance, the Zoning Administrator abused his discretion by not requiring that the applicant provide an early site specific geotechnical seismic hazard<sup>5</sup> and flood hazard analysis<sup>6</sup>.

As a result of this review process failure, the height, width, and mass requirements submitted by the Applicant and under consideration by the Commission are hypothetical and largely imaginary. If this Commission approves the proposed design, in future Building Department proceedings, the building officer will very likely require a redesign and a large increase in the size of the physical structure. The Zoning Administrator should have required early seismic hazard and flood analyses, and the Administrator's failure to request those early reports is fatal to the special use exception application. .

In light of these administrative process failure, at its June 6<sup>th</sup> hearing the Commission should defer action on the Special Use Exception application; should refer the matter back to staff to require early site-specific seismic and flood risk reports. With that information, the Applicant can reevaluate and the Commission will have sufficient information on whether the height, width, mass and grade placement of a redesigned structure meets the requirements of Salt Lake City Ordinances 21A.34.020-H and Salt Lake City Ordinance 21A.52.060.

Additionally, the proposed design does not comply with Salt Lake City Ordinance 21A.52.060(F) regarding environmental pollution<sup>7</sup>. As noted in my comment on terrorist attack risk,<sup>8</sup> some antiterrorist security measures are required by Department of Homeland Security regulations at 6 C.F.R. Part 27. Staff and applicant agent comments (included in the Briefing Materials) admit that due to the nature of the proposed site, it was impractical to install security fencing normally required to prevent theft, vandalism or terrorist attacks on the chemical facility:

Typically, culinary well buildings are completely enclosed with fencing to reduce the threat from potential vandalism, theft, and terrorism. The limited space available significantly prevents the ability to properly secure the location.<sup>9</sup>

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<sup>5</sup> IBC Section 1612, discussed below.

<sup>6</sup> IBC Section 1803, discussed below.

<sup>7</sup> "The proposed use and development will not cause material air, water, soil or noise pollution or other types of pollution."

<sup>8</sup> Letter by K. Fisher dated May 21, including in the May 31 version of the Briefing Materials.

<sup>9</sup> August 2018 DPU Staff Comment at 4 in the Briefing Materials.

The Bowen Memorandum also recognized the infeasibility of erecting security fencing at the site:

Fencing to restrict access to the well site is normally recommended to prevent vandalism or other unauthorized access. Due to the location of the well and the minimal existing set-backs, fencing does not appear to be feasible.<sup>10</sup>

A chemical release during a terrorist attack on this unsecured facility is an “other types of pollution” within the meaning of 21A.52.060(F), and the Special Use Exception application fails on this element.

The remainder of this comment provides background and supporting evidence concerning the administrative process failure alleged above.

**A building officer can and will conclude that an IBC flood analysis is required, and zoning staff could have ordered a FIRMs supplemental flood analysis.** The concept drawing for which the applicant seeks a special exception permit shows a building constructed at grade despite the fact that the 4<sup>th</sup> Avenue site has been subjected to repeated flooding from City Creek since 1860 and is located in the middle of the geologic stream bed of City Creek. My letter dated May 28 regarding high snow-melt flooding and cloudburst flooding provides other, credible data that the site has and will continue to be flooded at rates higher than 1 per every 100 years.<sup>1112</sup>

Facially, the staff and applicant’s action was lawful. The IBC *building permit* application process typically only requires that an applicant conduct a site-specific floodplain study if the proposed site is listed as a hazard zone on FEMA floodplain maps. Those maps are called “FIRM”s. An excerpt from the FIRMs map for the 4<sup>th</sup> Avenue and Canyon Road site<sup>13</sup> are shown in Figure 1, and a special flood hazard zone – that would automatically trigger a site-specific floodplain review –

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<sup>10</sup> Bowen Collins and Associates, circa August 2018, at 3, re: Salt Lake City Planning Commission Assessment Memorandum (hereafter the "Bowen Memorandum") (url: [https://docs.wixstatic.com/ugd/80b28b\\_0e07c5f9e8ff4047a4bd9405ee4d95cf.pdf](https://docs.wixstatic.com/ugd/80b28b_0e07c5f9e8ff4047a4bd9405ee4d95cf.pdf) ). The Bowen Memo is also in the Briefing Materials.

<sup>11</sup> Letter by K. Fisher dated May 25, 2019, included as Attachment B in May 28th Letter with Attachments "A" through "E" (url: <http://fisherka.csolutionshosting.net/misc/FourthAveWell/20190528WellTransHistoricLandMarkCommFinalwAttach.pdf> ).

<sup>12</sup> The May 25 letter on flooding should be restored to your Briefing Materials by June 6. Inexplicably, Commission staff deleted and reordered parts of my letter of May 28 as included in the May 31 version of your Briefing Materials. On June 4, I requested staff to restore the letter with all attachments. In the interim, the above url will provide the Commission members with a copy. <https://msc.fema.gov/portal/home>

<sup>13</sup> FIRMS Map 49035C0144H downloaded June 2, 2019, effective August 2, 2012 (url: <https://msc.fema.gov/portal/home> ).

appears about 400 feet north of the proposed structure. As published, the FIRMs for the site implies that there is less than 1 in 100 year chance of a flood occurring at the site.



**Figure 1 – FIRMs for the 4<sup>th</sup> Avenue Site. The project location is marked with a star.**

FIRMs maps are not fixed regulatory documents; they are generated at the national level. The IBC and Salt Lake City ordinance acknowledge that FIRMs can be too general and might need amendment to deal of local conditions. Section 1612 of the IBC provides that a *building officer* can utilize other waterway data sources to decide a FIRMs in not accurate and then require the applicant to prepare a site-specific flood analysis. Salt Lake City Ordinance 18.68.070, Administrative Firm Amendment,<sup>14</sup> permits a planner and-or building officer to initiate a FIRM amendment investigation whenever there are “conflicts between the mapped boundaries and actual field conditions” (*id*). A registered professional engineer is retained by the applicant and consultation by the City Floodplain Administrator, a “person designated by the director of the department of public utilities to direct the decision making process technical review by the City.”<sup>15</sup> Where a hazard is found, the building or zoning officer can require an engineering redesign solution that addresses the revised level of risk.

Here, the Zoning Administrator had the discretionary power to request the applicant to prepare a FIRMs site-specific flooding analysis. The Administrator choose not to do so and the result is a proposed structure that has insufficient mass and size to protect the health, life and safety of the public from flooding risk.

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<sup>14</sup> url: [https://www.sterlingcodifiers.com/codebook/getBookData.php?chapter\\_id=49032](https://www.sterlingcodifiers.com/codebook/getBookData.php?chapter_id=49032).

<sup>15</sup> Salt Lake City Ordinances 18.68.020.

**A building officer can and will conclude that an IBC seismic analysis is required.** A similar process governs the geotechnical risk of earthquake. Seismic risks do not preclude construction. The IBC based on national earthquake risk maps<sup>16</sup> imposes supplemental load design requirements that depend on the proposed use of the structure. The proposed structure is a chemical plant. The IBC has two types of classifications based on type-of-use that are related to the Well: the Well is a Class III structure that houses toxic chemicals or is a Class IV structure that is used to maintain water pressure<sup>17</sup>. Class III and IV risk buildings can only be reduced to a Class II structure requiring lower physical reinforcement based on a site-specific hazard assessment. No such site-specific analysis is in Attachment “A” of the Briefing Materials.

The second type of IBC classification related seismic risk at the proposed Well site is based on expected ground accelerations from national maps. Seismic Design Class A has the lowest accelerations during an earthquake; Class F the highest anticipated accelerations. Various online calculators simplify the process of determining risk and load factors applicable to a United States address.<sup>18</sup> The Applied Technology Council seismic map risk calculator indicates that the proposed 4<sup>th</sup> Avenue Well site is Seismic Class D.<sup>19</sup>

Under Section 1803 of the IBC, a *building official* must require a geotechnical analysis of the risk of seismic shaking and liquefaction for any Class D site.

In the instant matter, the Zoning Administrator had the discretionary power to request an early site-specific geotechnical assessment. One will be required in subsequent building permit proceedings. Your commentator has provided sufficient evidence in the record as to unique seismic risks that may be accounted for by national maps. No site specific geotechnical report appears in the Briefing Materials before the Commission.

The Administrator choose not to do require a geotechnical report and the result is a proposed structure that has insufficient mass and size to protect the health, life and safety of the public from seismic risk.

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<sup>16</sup> USGS. U.S. Seismic Hazard Maps. (url: <https://earthquake.usgs.gov/hazards/hazmaps/>); IBC § 1613.

<sup>17</sup> IBO § 1604.

<sup>18</sup> Applied Technology Council Hazards by Location Application. Accessed June 3, 2019 (url: <https://hazards.atcouncil.org/>).

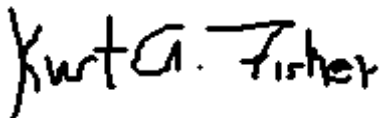
<sup>19</sup> ATC Report dated June 3, 2019, Attachment “A”, hereto.

**Motion recommendation:** At the June 6<sup>th</sup> hearing, the Commission should reject the application and require staff and the applicant to:

- 1) Submit a site-specific flood analysis that conforms to the IBC;
- 2) Submit a site-specific geotechnical analysis that conforms to the IBC;
- 3) Submit an antiterrorist attack analysis (6 C.F.R. Part 27);
- 4) Consistent with the results of those reports, the applicant should resubmit a redesigned chemical facility, if modifications are needed; and,
- 5) If a redesign requires greater height, width or mass, the Commission encourages the applicant to consider relocating facility described in the Hansen, Allen and Luce, Inc. report of April 2019.

The proposed Well should be moved to the May 9 open house Option 2c site<sup>20</sup> in the park at State and Canyon Road in a redesigned anti-terrorist and earthquake hardened structure. The DPU's May 9 concept design is a danger to the community and to first responders.

Very Truly Yours



Kurt A. Fisher

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#### **Attachments**

A – ATC Report on Seismic Risk Design Classification

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<sup>20</sup> Memorandum by David E. Hansen, Hansen, Allen and Luce, Inc., to B. Stewart, Salt Lake Department of Public Utilities, re: 4th Avenue Well Assessment (hereafter "HAL Report") (url: [https://docs.wixstatic.com/ugd/80b28b\\_3607f771b2984d63a44ce7a4c3d1c7a9.pdf](https://docs.wixstatic.com/ugd/80b28b_3607f771b2984d63a44ce7a4c3d1c7a9.pdf) ).

## Search Information

**Address:** 207 N Canyon Rd, Salt Lake City, UT 84103, USA

**Coordinates:** 40.77429989999999, -111.88631900000001

**Elevation:** 4411 ft

**Timestamp:** 2019-06-04T00:45:10.106Z

**Hazard Type:** Seismic

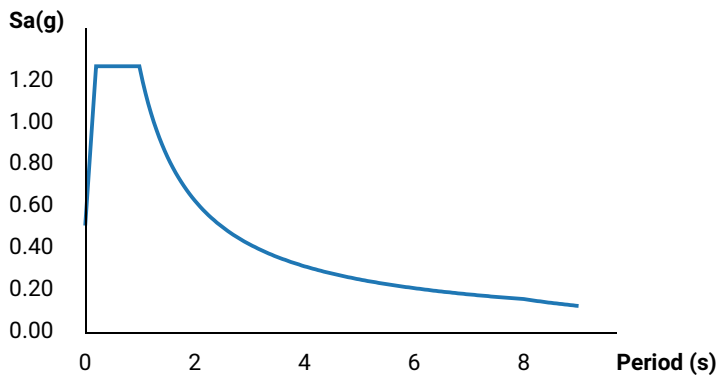
**Reference Document:** IBC-2015

**Risk Category:** IV

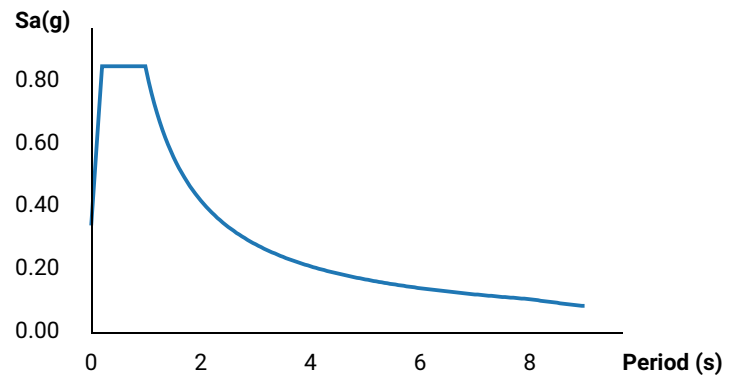
**Site Class:** E



### MCER Horizontal Response Spectrum



### Design Horizontal Response Spectrum



## Basic Parameters

Name	Value	Description
$S_S$	1.411	MCE <sub>R</sub> ground motion (period=0.2s)
$S_1$	0.522	MCE <sub>R</sub> ground motion (period=1.0s)
$S_{MS}$	1.269	Site-modified spectral acceleration value
$S_{M1}$	1.254	Site-modified spectral acceleration value
$S_{DS}$	0.846	Numeric seismic design value at 0.2s SA
$S_{D1}$	0.836	Numeric seismic design value at 1.0s SA

## Additional Information

Name	Value	Description
SDC	D	Seismic design category
$F_a$	0.9	Site amplification factor at 0.2s
$F_v$	2.4	Site amplification factor at 1.0s
$CR_S$	0.825	Coefficient of risk (0.2s)

$CR_1$	0.816	Coefficient of risk (1.0s)
PGA	0.602	$MCE_G$ peak ground acceleration
$F_{PGA}$	0.9	Site amplification factor at PGA
$PGA_M$	0.541	Site modified peak ground acceleration
$T_L$	8	Long-period transition period (s)
SsRT	1.411	Probabilistic risk-targeted ground motion (0.2s)
SsUH	1.71	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	2.416	Factored deterministic acceleration value (0.2s)
S1RT	0.522	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.64	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	1.018	Factored deterministic acceleration value (1.0s)
PGAd	0.881	Factored deterministic acceleration value (PGA)

*The results indicated here DO NOT reflect any state or local amendments to the values or any delineation lines made during the building code adoption process. Users should confirm any output obtained from this tool with the local Authority Having Jurisdiction before proceeding with design.*

## Disclaimer

Hazard loads are provided by the U.S. Geological Survey [Seismic Design Web Services](#).

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