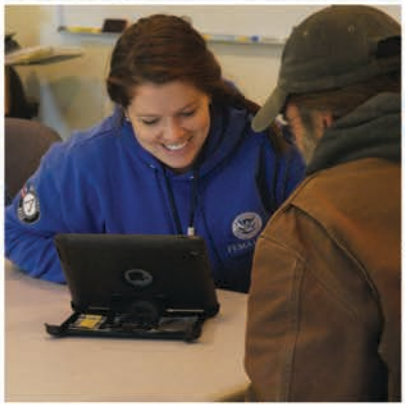
AURARIA
HIGHER EDUCATION
CENTER™

THREAT / HAZARD
IDENTIFICATION AND RISK ASSESSMENT



METROPOLITAN
STATE UNIVERSITY℠
OF DENVER

COMMUNITY
COLLEGE OF
DENVER

University of Colorado
Denver

HANDLING INSTRUCTIONS

1. The title of this document is *Auraria Higher Education Center (AHEC) Campus Threat/Hazard Identification and Risk Assessment (THIRA)*.

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CONTENTS

Handling Instructions 1
Contents 2
Jurisdiction Overview 3
Section 1: AHEC Assets 5
Section 2: Identify the Threats and Hazards of Concern 13
Section 3: How Critical Threats and Hazards Will Affect AHEC 24
Section 4: AHEC HIRA Data Analysis 43
Section 5: AHEC Hazard Prioritization 50

JURISDICTION OVERVIEW

Auraria is the largest campus by population in the State of Colorado. Three separate higher education institutions (University of Colorado Denver; Metropolitan State University of Denver; and Community College of Denver) enroll over 45,000 students. The Auraria Higher Education Center (AHEC) is the organizing umbrella of the campus.

The three institutions share classroom space and general services on the campus, located in the heart of downtown Denver. Denver is the capital and highest populous city of the state of Colorado. It is located just east of the eastern foothills of the Rocky Mountains and earned its nickname as the "Mile-High City" due to its elevation of one mile, or 5280 feet, above sea level.

Geography and Climate

Denver is located in the center of the Front Range urban corridor, between the Rocky Mountains and the High Plains. The South Platte River bisects the city, and many creeks, small lakes, and reservoirs grace the metropolitan area.

The Auraria Campus is situated in northwest Denver, encompassed by the three intersections of Auraria Parkway (north-northwest of campus), W. Colfax Ave. (south of campus), and N. Speer Blvd. (east of campus). The South Platte River is located less than a quarter-mile from the Auraria Campus, running north to south-southwest, coming closest to the campus at the intersection of Auraria Pkwy and W. Colfax Ave. Cherry Creek branches off South Platte River north of campus and runs parallel to N. Speer Blvd to the east of campus.

Denver's climate is semi-arid and has four distinct seasons, with typically dry falls and winters and wetter springs and summers. Fall is often pleasant and dry. Denver's winters can vary from mild to cold, and although large amounts of snow can fall on the mountains just west of the city, the air frequently dries out before passing over the Front Range, shadowing the city from precipitation for much of the season. Additionally, warm Chinook winds occasionally occur, quickly melting snow accumulations and making Denver's winters milder than surrounding areas. Denver averages 61 inches of seasonal snowfall. The winter/snow season in Denver generally starts around October 8th and goes until close to April 27th. Approximately every three to four years, Denver will experience an extreme snowstorm or blizzard. Spring can be windy with highly changeable weather, where an occasional blizzard, heavy, wet snow, large daily temperature changes, or a gentle, soaking rain can be common. Summers are usually hot with low humidity with a constant threat of thunderstorms due to the unique positioning of the city off the eastern slope of the Rocky Mountains. These thunderstorms can be large with damaging hail.

AHEC Authority

The Board of Directors of the Auraria Higher Education Center (the "Auraria Board") is a body corporate and agency of the State of Colorado created pursuant to the Colorado Revised Statutes, § 23-70-101, et seq. The Auraria Board governs the Auraria Higher Education Center (AHEC), which was created in 1974 to provide the land, physical plant, and facilities necessary to house

three separate state institutions of higher education in downtown Denver—the University of Colorado Denver (CU Denver), Metropolitan State University of Denver (MSU Denver), and Community College of Denver (CCD). These constituent institutions remain separate educational institutions in terms of mission and governance, while at the same time offering cooperative academic programs and sharing the services and facilities of the campus.

The Auraria Board is comprised of eleven members, of which nine are voting members and two are nonvoting members. Three of the voting members are appointed by the Governor. Three other voting members are the chief executive officers of the constituent institutions. Three other voting members are appointed, one from among the members of each of the Regents of the University of Colorado, the Board of Trustees for MSU Denver, and the State Board for Community Colleges and Occupational Education, which persons serve at the pleasure of the appointing board so long as that person remains a member of that board. One nonvoting member is elected to serve on the Auraria Board from the Student Advisory Committee to the Auraria Board, comprised of six full-time students, two from each constituent institution. Another nonvoting member is elected from the Faculty Advisory Committee to the Auraria Board, comprised of six full-time faculty members, two from each constituent institution.

Among its statutory duties, the Auraria Board has the responsibility to plan, construct, own, lease, dispose of, acquire, operate, maintain, and manage the physical plant, facilities, buildings, and grounds of the Auraria Campus and to allocate among the constituent institutions suitable space on the Auraria Campus, in accordance with their needs. Additionally, the Auraria Board provides auxiliary services for the campus, including parking; daycare; the Tivoli Student Union with a campus bookstore, food service, student services, and conference space; and campus police and security services. By law, it is the responsibility of the governing board of each constituent institution to establish, maintain, and conduct the academic programming for its respective institution.

SECTION 1: AHEC ASSETS

When conducting a comprehensive THIRA for any jurisdiction, it is important to identify some of the critical assets and infrastructure, as well as their quantifiable value to the community. For the AHEC THIRA, we have chosen critical assets as being **Campus Structures**, **AHEC Vehicles and Parking Revenue**, and the **Student/Staff Population** (*Student/Staff Population* is not listed as a "life safety" subject in this section, but rather a commodity which affects the budget and revenue of the schools and organizations on the Auraria Campus).

By identifying critical assets, and evaluating how different hazards may affect each of these said assets, a more accurate analysis can be made regarding the risks of each hazard.

Examples of Asset Analysis Factors against Hazard Risks:

- *If a tornado were to pass through the Auraria Campus and demolish the 7th Street Parking Garage, what would be the impact on campus revenue?*
- *If the Science Building were damaged by a large fire, and much of the building was considered "not useable for instructional occupancy" until major repairs and structural upgrades are made, and if these repairs take two-three semesters to complete, how does this affect which classes will be offered during that time? How will the lack of course offerings affect overall registration?*
- *If a highly charged political atmosphere caused regular civil unrest on the Auraria Campus, and many students and faculty felt unsafe on campus, how would the steady loss of students and faculty affect the reputation and growth of the institutions on campus?*

Campus Structures

Structure	Building Value	Contents Value	Number of Stories	Building Construct.	Sq. Feet	Occupancy Type
7th Street Classroom	4,894,445	28,196	1	Masonry	23,633	Office/ Classroom
Administration Bldg	21,652,000	696,841	5	Masonry	127,923	Educational
Architecture Bldg.-Annex	217,180	32,288	2	Frame	1,641	Office
Arts Building	26,085,000	184,567	2	Masonry	128,139	Educ./ Classrooms
Central Classroom	15,280,000	62,409	3	Joisted Masonry	85,697	Educ./ Classrooms
Children's College	1,019,126	39,677	1	Joisted Masonry	5,259	Day Care
Early Learning Center	4,228,339	105,665	1	Masonry	18,426	Day Care
Facilities Management	1,849,945	917,954	1.5	Frame	16,818	Office/ Industrial Shop

Structure	Building Value	Contents Value	Number of Stories	Building Construct.	Sq. Feet	Occupancy Type
Facilities Storage 1/2	145,720	100,000	1	Metal	3,924	Storage
Facilities Storage 3	38,063	5,170	1	Frame	912	Storage
Faculty Club/Kitchen (1041 9th)	359,618	36,808	2	Frame	2,481	Educational
Golda Meir House	405,461	52,569	1	Frame	2,933	Educational
Hazmat	43,742	5,170	1	Frame	244	Storage
King Center	45,901,000	4,160,000	5	Masonry	192,684	Classrooms/ Assembly
Library	41,778,000	551,377	2	Masonry	184,832	Educational
Facilities Annex	1,538,271	601,822	1	Reinforced concrete columns and beams	7,381	Educational/ Industrial Shop
Modular Classroom #4	94,040	22,207	1	Modular	978	Classroom
North Chiller Plant	276,843	775,500	1	Masonry	2,190	Utility
North Classroom	54,950,000	875,018	5	Masonry	259,211	Educ./ Classrooms
Office at 1045/47 (Duplex)	350,575	18,585	2	Frame	2,558	Educational
Office at 1015 9th St	332,624	32,460	2	Frame	3,292	Educational
Office at 1020 9th St	220,628	14,469	2	Frame	1,777	Educational
Office at 1024 9th St	221,614	21,968	2	Frame	1,674	Educational
Office at 1027 9th St	313,292	56,484	2	Frame	2,206	Educational
Office at 1033 9th St	217,073	14,054	2	Frame	1,513	Educational
Office at 1050 9th St	142,178	11,953	1	Frame	1,298	Educational
Office at 1051 9th St	220,223	15,729	2	Frame	1,690	Educational
Office at 1056 9th St	150,247	51,119	1	Frame	1,825	Educational
Office at 1059 9th St	264,183	14,273	2	Frame	1,860	Educational
Office at 1061 9th St	241,646	19,188	2	Frame	1,486	Educational

Structure	Building Value	Contents Value	Number of Stories	Building Construct.	Sq. Feet	Occupancy Type
Office at 1068 9th St	290,198	16,025	2	Frame	1,840	Educational
Parking Garage, 7th Street	28,223,000	519,474	4	masonry or concrete load bearing walls with or without pilasters	622,892	Parking Garage
Parking Garage, Tivoli	18,237,000	393,801	5	Reinforced concrete columns and beams	314,131	Parking Garage
Physical Education	28,094,000	384,420	2	Joisted Masonry	126,435	Educ./ Classrooms
Playing Field Restrooms	106,938	2,714	1	Masonry	580	Utility
Plaza Building	22,193,000	2,961,198	3	Masonry	119,101	Educ./ Classrooms
Printing/Distr Center	1,657,008	365,151	1	Masonry	10,089	Educational
Pump House/Irrigation	61,149	11,147	1	Joisted Masonry	336	Utility
Rectory Office	1,089,985	23,075	2	Frame	7,999	Educational
Science	82,817,000	391,773	4	Joisted Masonry	317,070	Educational
Mercantile (9th St)	526,977	48,510	2	Frame	3,907	Restaurant
South Chiller Plant	2,467,803	775,500	1	Masonry	3,220	Utility
South Classroom	24,858,000	190,755	3	Masonry	147,746	Educ./ Classrooms
St. Cajetan's Center	4,917,000	57,412	4	Frame	15,318	Classrooms/ Assembly
Technology Building	12,619,000	148,097	1	Masonry	59,872	Educ./ Classrooms
Tivoli Student Union	65,254,314	5,802,331	7	Wood or steel studs in bearing wall; wood or steel frame	309,881	Educational
Tivoli Storage	70,332	50,000	1	Frame	1,500	Storage
West Classroom	14,406,000	139,256	2	Joisted Masonry	85,634	Educ./ Classrooms
TOTAL COST	**531,319,780**	**21,804,159**				

AHEC Vehicles and Parking

Vehicles

Serial Number	Description	Shop	Cost
FG9898-717407	Club Car Carryall 1998	FM-Access Control	
Llv4300h330698	4300 John Deere 2000	FM -Grounds	
99007009	Cushman Truckster 1999	FM-Grounds	
AE0743-827240	Carryall II 2007	FM-Grounds	
JR1-300479	Yamaha Golf Cart 1999	Media Center	
1FTNE14WX8DB22669	Ford F150 Van 2008	SFM-SAS	17747
HS-1073	Yanmar	FM-Grounds	
F9935-797956	Club Car Carryall 1999	CCD-Telecom	
HP462EC	Howard Price Tractor H180	FM-Grounds	
30795-30313	Toro GM 325D 1993	FM-Grounds	
2112529	Ez Go 2003	FM-Plumbing	
2239340	Ez Go 2005	Housekeeping	
KN3HNS8D32K423890	Vantage Compact Van 2002	FM- Paint	
2239373	Ez Go 2005	FM-HVAC	
2239344	Ez Go 2005	FM-Sign Shop/Aux	
RG911-008525	Carryall ll 2009	FM-Access Control	
30364-270000237	Toro 7210 2008	FM-Grounds	
LFBJBBB107JC00308	Vantage Compact Van 2007	FM-Aux	
LFBOC1347C6F21660	Vantage Compact Van 2012	FM- Fire/Security	
30464-310000140	Toro 7210 2010	FM-Grounds	
M00345 C095449	345 John Deere	FM-Grounds	
BOC1436A6F48755	Vantage Compact Van 2011	Mail Services	
60B9442	Cushman Compact Truck 2002	FM-Gen Maint	
30795-90308	Toro GM 325D 1999	FM-Grounds	
RG0412-376646	Carryall II 2004	FM Grounds	
60C9883	Cushman Compact Truck 2004	FM-HVAC	
BOC1439B6F18957	Vantage Compact Van 2011	Media Center	
60D1778	Cushman Compact Truck 2004	FM-Vehicle Maint	
JN6-403940	Yamaha 2000	FM-Health/ Safety	
LFWAIFI234JA95066	Vantage Compact Truck 2004	FM-HVAC	
RG9941-813342	Carryall ll 1999	FM-Grounds	
FG9844- 710546	Carryall l 1998	FM- Grounds	
WH 1000E 1426545	Ez Go 2001	FM-HVAC	
2239390	Ez Go 2005	FM-Electrical	
WH 1000E 1426546	Ez Go 2001	FM- Access Control	
J303 2029508	Ez Go 2003	FM-HVAC	
JU1313 354584	Carryall Vl	FM-Grounds	
1V9P75PA99C113235	Vantage 2009 EVP 1000	Health Center	
TC3235A050110	3235A John Deere	FM-Grounds	
JN6-404632	Yamaha 2000	FM-HVAC	
1FTBF2B66CEA41762	Ford Pickup 2012	SFM-Grounds	24425
1FTBF2B69CEC13508	Ford Pickup 2012	SFM-Grounds	21468
5031833	Ez Go 2009	FM-HVAC	

Serial Number	Description	Shop	Cost
IB7HC16Y7XS280205	Dodge Truck 1999	SFM-Electrical	16464
LFBJBBBI64JA95026	Vantage Compact Van 2004	FM-Paint	
60 B9506	Cushman Compact Truck 2002	FM-Paint	
JN6-404644	Yamaha 2000	FM-Plumbing	
WOO4X2095880	John Deere Gator 2003	Metro Baseball	
2239262	Ez Go 2005	Housekeeping	
LFWAIFI286JB50050	Vantage Compact Truck 2005	FM- Electrical	
1GTGC24R2WZ546099	GMC Pickup 1998	SFM-Auxiliary	19772
MOXUVGX10871	John Deere Gator 2007	Tivoli	
BOC1436A6F48755	Vantage Compact Van 2011	FM- Electrical	
1GCDT19E688204229	Chevy Pickup 2008	SFM Facilities Man.	
LFWA22152B6H04230	Vantage Compact Truck 2011	FM-HVAC	
LFWA22156B6H04134	Vantage Compact Truck 2011	FM-HVAC	
1FTJW36H1VEC15639	Ford Pickup 1997	SFM-Gen Maint	
LFWA22159CJH06300	Vantage Compact Truck 2012	FM-Gen Maint	
60 C2217	Cushman Compact Truck 2003	Telecom	
L799-1219404	Ez Go 1999	FM-Grounds	
1GTGG25R3W1096111	GMC Van 1998	SFM-Sign Shop/Aux	19391
MOHP4GX042637	John Deere Gator 2005	Tivoli	
60 B9469	Cushman Compact Truck 2002	FM-Gen Maint	
1GTGC24ROWZ546537	GMC Pickup 1998	SFM-Gen Maint	19772
1FTBF2B68CEA16894	Ford Pickup 2012	SFM-Grounds	20715
JALB4B1KXR7009915	Isuzu Truck 1994	SFM- SAS	
JN6-404636	Yamaha 2000	FM-Electrical	
7052902052	Jacobsen HR9016 2011	FM-Grounds	
STC52-E8900438	Scag 2012	FM-Grounds	
SCR48-5590219	Scag 2003	FM-Grounds	
1GCDT146758273636	Chevy Colorado 2005	SFM-Grounds	13878
2239402	Ez Go 2005	FM-Gen Maint	
8986328-97019693	Cushman Truckster 1997	FM-Grounds	
30627 25000391	Toro GM 328D 2005	FM-Grounds	
1FTZF1769WKB36713	Ford F150 Truck 1998	SFM-Electrical	
1GCDG15Z6SF191353	Chevy Van 1995	SFM-Plumbing	17180
1FTNF21568EB82733	Ford F250 2008	SFM-Grounds	25098
JV0707728540	Carryall 2007	Tivoli	
J402 1517796	Ez Go Work Horse 2002	FM-Grounds	
1GDJC34K5ME528923	GMC Dump Truck 1991	SFM-Grounds	
LFWA22152CJH06199	Vantage Compact Truck 2012	FM-Plumbing	
1GTCS14XOW8527616	GMC Pickup 1998	SFM-Aux	15013
B2 48 TT- 147254	Taylor Dunn 2001	FM-Paint	
AE0743-827241	Carryall II 2007	FM-Grounds	
JN6-404544	Yamaha 2002	FM-Electrical	
J402 1517795	Ez Go Work Horse 2002	FM-Grounds	
1286283	Ez Go MPT 2003	FM-Grounds	
WH1000E-1557246	Ez Go Work Horse 2002	Support Services	
B2 48 TT 148367	Taylor Dunn 2001	Housekeeping	
B2 48 TT 148368	Taylor Dunn 2001	Housekeeping	

Serial Number	Description	Shop	Cost
IFDXF46FOYEC39751	Ford F350 Flatbed 2000	SFM-Grounds	
1B7HC16Y5XS280204	Dodge Pickup 1999	SFM-Plumbing	16464
JALE5W167A7901578	Isuzu 435 Sweeper 2010	SFM-Grounds/Utility	110675
2C4JDGAG8CR346496	Dodge Caravan 2012	SFM Mail Services	20357
PG9438 408405	Carrryall 1 1994	FM-Grounds	
2C4JRGAG0DR813297	Dodge Caravan 2013	SFM-Mail Services	20216
2447573	Ez Go MPT 2006	FM-Grounds	
9828636	CM 274 Ford Tractor	FM-Grounds	
2447569	Ez Go MPT 2006	FM-Grounds	
WH-1000E 1559678	Ez Go 2002	FM-Lock Shop	
J303-2029521	Ez Go 2003	FM-Electrical	
K200-1318206	Ez Go 2000	Metro Ath A	
J200-1303713	Ez Go 2000	Metro Ath B	
M202-1558062	Ez Go 2002	Metro Ath C	
2442955	Ez Go 2006	Housekeeping	
FG9732-594000	Club Car Carryall 1997	FM-Grounds/Utility	
PG9745-619838	Club Car Carryall 1997	FM-Grounds	
2C4RDGBG3CR374014	Dodge Caravan 2012	SFM-Housekeeping	21011
J402 1517798	Ez Go Work Horse 2002	FM Grounds	
1GB3GCG2B1171983	Chevy Cube Van 2011	SFM-Support Service	39462
2GBHG31K6L4136726	Chevy Cube Van 1990	SFM-Support Service	
1156821	Workhorse EZ Loader 2000	Telecomm	
2D4RN3DG2BR721756	Dodge Caravan 2011	SFM-Parking	20804
2C4RDGBG5CR374015	Dodge Caravan 2012	SFM-Parking	21011
2D4RN4DE7AR405479	Dodge Caravan 2010	SFM-Parking	19045
2D4RN4DE3AR405480	Dodge Caravan 2010	SFM-Parking	19045
1D8GP25E47B209915	Dodge Caravan 2007	SPM-Parking	18370
1FDWE35L45HA24693	Ford E350 Van 2005	SFM Parking	39260
2FABP7BV0AX146056	Ford Crown Vic 2010	SFM-Public Safety	25831
2FABP7BV2AX146057	Ford Crown Vic 2010	SFM-Public Safety	25831
2FAFP71W01X169753	Ford Crown Vic 2001	SFM-Public Safety	25877
2FABP7BVXBX169443	Ford Crown Vic 2011	SFM-Public Safety	23130
2FABP7BV8BX169442	Ford Crown Vic 2011	SFM-Public Safety	25731
2FABP7BV9AX146055	Ford Crown Vic 2010	SFM-Public Safety	25831
2FAFP71W43X130649	Ford Crown Vic 2003	SFM-Public Safety	24006
2G1WS55R579416109	Chevy Impala 2007	SFM-Public Safety	22376
2C3CDXAG6DH717689	Dodge Charger 2013	SFM- Public Safety	29063
1FMPU16L74LB42341	Ford Expedition 2004	SFM- Public Safety	27000
1FMPU16L84LB42347	Ford Expedition 2004	SFM Public Safety	27000
1FMJU1G58CEF52347	Ford Expedition 2012	SFM Public Safety	32102
2C3CDXAG6CH262891	Dodge Charger 2012	SFM-Public Safety	27801
2C3CDXAG4CH262890	Dodge Charger 2012	SFM-Public Safety	27801
L300 1329924	Ez Go 2000	Public Safety	
FE290DE454180	Kawasaki 2001	Public Safety	
FE290DE485193	Kawasaki 2001	Public Safety	
LFBJBBBIX8JC00110	Vantage Compact Van 2008	Public Safety	
	Bob Cat 2013/12014	FM- Grounds	

Serial Number	Description	Shop	Cost
132 48 TT-146656	Taylor Dunn 2001	MSVD Information Tec.	
2451683	Ez Go 2005	MSVD	
K499 1222319	Ez Go 1999	FM-Vehicle Maint	
AG9428 387210	Ez Go 1994	Housekeeping	
2112515	Ez Go 2003	FM-Vehicle Maint	
2483959	Ez Go 2007	Information Tec.	
1V9C55SPAX9C113426	Vantage Compact Van E 2009	MSVD Information Tec.	
2112489	Ez Go 2003	FM-HVAC	
2608908	Ez Go 2007	MSVD	
4AM-00160	Caterpillar Forklift 1994	Book Store	
2765895	Ez Go 2011	MSVD	
2463215	Ez Go 2007	MSVD	
1FBSS31L79DA63782	Ford E350 Van 2009	SFM-MSVD	
1FBJS31H4SHA38540	Ford E350 Van 1995	SFM-MSVD	
1GAHG39U371206917	Chevy Express Van 2007	SFM-MSVD	
1GJHG36R921218252	GMC Savana Van 2002- White	SFM-MSVD	
1GJHG39R721218489	GMC Savana Van 2002- Blue	SFM-MSVD	
1GNDX03E5XD235363	Chevy Venture 1999	SFM-MSVD	
HA61JRT-AD109826	Articulated Lift	FM-Electrical	
PR0544-568306	Club Car 2005	Tivoli	
GR0733-797113	Club Car 2007	Tivoli	
AG9428 387196	Club Car 1994	FM-Grounds	
LFWA1F12XBJA03948	Vantage Compact Truck 2012	CCD	
LFWA22157B6H04188	Vantage Compact Truck 2011	Parking	
LFBJBBB137JC00304	Vantage Compact Van 2008	Parking	
2200816	Ez Go MPT 1000 2004	Parking	
RG0833-936512	Club Car Carryall ll 2008	Parking	
RG0833-937250	Club Car carryall ll 2008	Parking	
5037416	Ez Go 2009	MSVD-EH&S	
60-B4265	Cushman Compact Truck 2001		
LFBJBBB117JC00124	Vantage Compact Van 2009	CCD	
	Total (Purchase value only available for vehicles registered with State Fleet)		**$983,112**

Parking

Parking Lot/Structure	Annual Revenue *
Aspen	131076
Beech	81924
Birch	54609
Cherry	240998
Dogwood	218061
Elm	542443
Fir	154206
Holly	915420
Nutmeg	109734
Spruce	316344
Walnut	66921
7th Street Garage	1656682
Tivoli Garage	1280000
Total	**$5,768,418.00**

*note – Values listed in this table (Parking) are only the **revenue generated** by each lot, and not the value of the structures/contents. This table does not include "permit-only" lots, such as Maple, Juniper, or Dogwood annex. It also does not include revenue from individually-issued parking permits.

Census

The highest campus census is during the fall and spring semesters. Fall runs from the third week of August (August 18th for the 2014 fall semester) until approximately the second week of December. Spring runs from the third week of January (January 20th for the 2015 spring semester) until approximately second week of May.

During peak fall and spring semesters, the approximate registered attendance of the combined campus is 45,000 students and 4,500 faculty/staff. However the student full-time equivalent (FTE) number is actually closer to around 30,000 students, based on the theory that the average student is only on campus 2/3 of the time.

SECTION 2: IDENTIFY THE THREATS AND HAZARDS OF CONCERN

Based on a combination of experience, forecasting, subject matter expertise, and other available resources, Section 2 is a list of the threats and hazards of primary concern to the Auraria Campus.

Fixed Hazards

Energy Disruption

Energy Disruption is the manipulation of energy by either the end user or some other variable that affects the energy's consistency between the source and the end user. In the context of this THIRA, the term "energy" pertains to any source of power supply used by the public for the purpose of critical living functions (i.e., electricity, natural gas, liquefied petroleum gas, steam, and other fuels used for heating or generating electricity).

The hazards in respect to energy disruption come in the form of both natural and human-made threats to the power supplies used by the public for the purpose of critical living functions. These could include:

- Weather hazards (wind, ice, interfering debris created by extreme weather) damaging power stations or power lines in our area;
- Human-made hazards such as accidental operational failures at the source or along its network, accidental outside interference in the energy's network (e.g., vehicle accident with a transformer or gas line), or intentional attack on said energy's network for purposes of terrorism.

Example: In 1985, an unusual cold front for late September settled over the Denver metro area and resulted in 8-12 inches of snow. The 8.7 inches of snow measured at Stapleton International Airport was the city's heaviest snowfall since 1971. Snow-laden tree limbs snapped over all of metro Denver causing widespread power outages.

Hazardous Materials Incident – On-Campus / Fixed Facility Off-Campus

A hazardous material incident is defined as any actual or threatened uncontrolled release of a hazardous material, its hazardous reaction, or the energy released by its reactions, that pose a significant risk to human life and health, property, and/or the environment.

EPA regulations[2] address "hazardous substances" and "extremely hazardous substances." Hazardous substances are generally materials that, if released into the environment, tend to persist for long periods and pose long-term health hazards for living organisms. They are primarily chronic rather than acute health hazards. Regulations require that spills of these materials into the environment in amounts at or above their individual reportable quantities must be reported to the Environmental Protection Agency (EPA). Extremely hazardous substances are generally toxic materials that are acute health hazards. When these substances are released, they

[2] Emergency Planning and Community Right-to-Know Act (EPCRA) – Section 304

are immediately dangerous to the life of humans and animals and will cause serious damage to the environment. When facilities have these materials in quantities at or above their threshold planning quantities (TPQ), they must submit Tier II information to their local fire department, as well as the State and Local Emergency Planning Committees (LEPC). The LEPC retains this data and uses it for emergency planning. It is available to the public for their review under the Community Right to Know Act.

The National Fire Protection Association (NFPA) develops codes and standards for the safe storage and use of hazardous materials. These codes are generally adopted locally and include the use of the NFPA 704[3] standard for communication of chemical hazards in terms of health, fire, instability, and other special hazards (such as water reactivity and oxidizer characteristics). Diamond shaped NFPA 704 signs ranking the health, fire and instability hazards on a numeric scale from zero (least) to four (greatest) along with any special hazards, are usually required to be posted on chemical storage buildings, tanks, other facilities, and individual containers stored or used inside facilities.

The Colorado Department of Public Health and Environment receives reports of spills and releases that occur throughout the state. These calls are all followed up on to determine if there was an actual release that would threaten life, property, or the environment. Within the City and County of Denver, during the period of March 1st - July 24th, 2011, there were 30 reported spills. These reports are available from the LEPC to review at any time.

Releases must also be reported to the National Reporting Center (NRC). A query can be run to see what kind of releases have occurred in Denver, where they occurred, what the substance was, and what happened to cause the release.

There are currently over 170 companies in Denver that report they use or store hazardous materials at "fixed-sites" in their daily operations. While almost half do not hold chemicals other than those used in batteries, there are several companies that use ammonia and chlorine daily.

Structure Fires

A structure fire is a fire involving the structural components of various residential buildings ranging from single-family detached homes and townhouses to apartments and tower blocks, or various commercial buildings ranging from offices to shopping malls. It is not unusual for some fire departments to have a pre-determined mobilization plan for when a fire incident is reported in certain structures in their area. This plan may include mobilizing the nearest aerial firefighting vehicle to a tower block, or a foam-carrying vehicle to structures known to contain certain hazardous chemicals.

2012 Denver Fire Report:[4]

Total fires in District 2 –	273
Total Structure Fire losses in District 2 -	$1,500,760

[3] NFPA 704: Standard System for the Identification of the Hazards of Materials for Emergency Response
[4] Denver Fire Department 2012 Annual Report

Mobile / Transportation Hazards

Hazardous Materials Incident – Train or Truck Haul

In addition to the defined descriptions and information covered previously under the *Hazardous Materials Incident – On-Campus / Fixed Facility Off-Campus* section, and the regulatory requirements levied by the EPA and the NFPA, ***when transported***, hazardous materials must also follow regulatory requirements by the U.S. Department of Transportation (DOT).

DOT defines hazardous material as a substance that is capable of posing an unreasonable risk to health, safety, and property when transported in commerce. When a hazardous material meets the DOT definition of a hazardous material, it must be transported under safety regulations providing for appropriate packaging, communication of hazards, and proper shipping controls.

There are hazardous materials being transported throughout the city on a regular basis. There is always the potential for a release from either truck-hauled or train-hauled hazardous materials passing through or near the Auraria Campus.

Light Rail or Bus Accident – Mass Casualty Incident

A mass casualty incident (MCI) is any incident in which emergency medical services resources, such as personnel and equipment, are overwhelmed by the number and severity of casualties[5]. For example, an incident where a two-person crew is responding to a motor vehicle collision with three severely injured people could be considered a mass casualty incident. The general public more commonly recognizes events such as building collapses, train and bus collisions, earthquakes, and other large-scale emergencies as mass casualty incidents.

Situational Hazards (Natural and Human-Made)

Civil Disorder

Civil disorder, also known as civil unrest or civil strife, is a broad term that is typically used by law enforcement to describe one or more forms of unrest caused by a group of people. Civil disturbance is typically a symptom of, and a form of protest against, major socio-political problems; the severity of the action coincides with public expression(s) of displeasure. Examples of civil disorder include, but are not necessarily limited to: illegal parades; sit-ins and other forms of obstructions; riots; sabotage; and other forms of crime. It is intended to be a demonstration to the public and the government, but can escalate into general chaos.

Notable acts of civil disorder in Denver in the last 15 years:

Incident / Year	Approx. Cost of Damage
Denver Bronco's Super Bowl Win – 1998	$180,000
Denver Bronco's Super Bowl Win – 1999	$160,000
Colorado Avalanche Stanley Cup Win – 2001	Not Reported/Not Quantifiable
Democratic National Convention in Denver – 2008	Not Reported/Not Quantifiable
Occupy Wall Street Movement in Denver – 2011/2012	$40,000

[5] FEMA National Incident Management System (NIMS) Guidance – Dec 2008

Disease Outbreak

The scale of a biological incident is described by the extent of the spread of disease in a community. An outbreak can be classified as an endemic, an epidemic, or a pandemic depending on the prevalence of the disease locally and around the world. An endemic is defined as something that is natural to, or characteristic of, a particular place, population, or climate. For example, threadworm infections are endemic in the tropics. An epidemic is defined as a disease that spreads rapidly through a demographic segment of the human population, such as everyone in a given geographic area, a military base, or similar population unit, or everyone of a certain age or sex, such as the children or women of a region. A pandemic is defined as a widespread epidemic that affects whole countries or the entire world.

Many potential devastating diseases are spread through physical contact, ingestion, insects, and inhalation. Airborne diseases and those spread through physical contact pose higher risks to the community because they are difficult to control. Diseases such as influenza, Pertussis, Tuberculosis, and meningitis are all spread through these methods and pose a threat to all communities. Health agencies closely monitor for diseases with the potential to cause an epidemic and seek to develop immunizations.

Communicable reported diseases for 2012 in Denver County[6]:

Diagnosis	Denver County
Campylobacteriosis	82
Cryptosporidiosis	6
Giardiasis	60
Group A strep invasive	26
Group B strep invasive	56
Haemophilus influenzae	6
Hemolytic uremic syndrome	0
Hepatitis A	2
Hepatitis B, acute	2
Hepatitis C, acute	11
Influenza-hospitalized	77
Legionellosis	4
Listeriosis	2
Meningococcal disease	0
Pertussis (Whooping Cough)	153
Q fever - acute	1
STEC (shiga toxin producing E. coli)	4
Salmonellosis	39
Shigellosis	10
Strep. pneumoniae invasive	63
Typhoid fever	0
Varicella (Chicken Pox)	29
West Nile virus	15

[6] Denver Center for Public Health Preparedness – Denver County cases of selected reportable diseases 2012

Earthquake

An earthquake is simply the vibrations caused by fault movement: the bigger the movement, the bigger the earthquake. Because the mountains are still rising in Colorado, earthquakes will continue to accompany the faulting that enables them to grow. Earthquakes generate seismic waves that can be detected by sensitive instruments called seismographs. Records of seismic waves (called seismograms) are used by seismologists to locate and measure the size of earthquakes.

There are no active fault lines in Denver County, however there have been several earthquakes that have impacted the Denver area:

- November 7, 1882 (6.6)
- June 5, 1963 (5.0)
- January 4, 1966 (5.0)
- August 9, 1967 (5.3)
- November 27, 1967 (5.2)

Extreme Heat

Extreme heat conditions are defined by summertime weather that is substantially hotter and/or more humid than average for a location at that time of year. This definition for extreme heat may be refined with considerations, such as summertime temperatures that hover 10 degrees or more above the average high temperature for the region and last for several weeks. The heat index (HI) or the "Apparent Temperature" is an accurate measurement of how hot it actually feels when relative humidity (RH) is added to the actual air temperature. The heat index may be used to help determine when an extreme heat event is occurring. Heat alert procedures from the National Weather Service (NWS) are based mainly on heat index values.

In August 2011, Denver had its hottest August in its history. There were six record high temperatures that were either tied or broken during the month, and it was the sixth hottest month in Denver history. During 2008, Denver's 87-year-old record for the number of consecutive days above 90 degrees F was broken. The new record of twenty-four consecutive days surpassed the previous record by almost a week. On August 1st, it reached 104 degrees, breaking a record set in 1938, and on August 2nd, it reached 103 degrees, breaking a record set in 1878. The average number of 90-degree days per year in Denver is 33.

Extreme Weather Hazards (excluding heat and winter) – Hail, Lightning, Tornadoes

Hail is described as showery precipitation in the form of irregular pellets or balls of ice. Formation of hail occurs inside a thunderstorm where there are strong updrafts of warm air and downdrafts of cold air. If a water droplet is picked up by the updrafts it can be carried high enough to where temperatures fall below 32 degrees F, where it freezes. As the frozen droplet begins to fall, carried by cold downdrafts, it may thaw as it moves into warmer air toward the bottom of the thunderstorm. The half-frozen droplet may get picked up again by another updraft where it is carried back into very cold air and refreezing it. With each trip above and below the freezing level, the frozen droplet adds another layer of ice. The frozen droplet eventually falls to

the ground as hail, which can reach speeds up to 120 mph. Research has shown that damage occurs after hail reaches around one-inch in diameter and larger. Hail of this size will trigger a severe thunderstorm warning from the NWS.

In North America, hail is most common in the area where Colorado, Nebraska, and Wyoming meet, known as "Hail Alley." Hail in this region occurs between the months of March and October during the afternoon and evening hours. Colorado's damaging hail season is considered to be from mid-April to mid-August.

There is a high occurrence of hail events on the eastern side of Colorado. Since 1950, 93 percent of all reported hail events occurred in the eastern part of the state, with most of the events concentrated in the northeast. There are three counties with over 500 reported hail events between 1950 and 2010.

El Paso County has the highest number of hail events with 884, followed by Weld County with 600, and Yuma County with 578. Although these counties account for 24 percent of total reported events combined, they only account for one percent of total reported damage. Areas with higher density, including Denver, have more reported damage than other areas in Colorado with less density. Denver actually had the costliest hail storm since 1990 in terms of insured losses in the Rocky Mountain region. On the night of July 20th, 2009, a strong storm hit the northwest suburbs of Denver, dumping as much as an inch of rain in less than an hour with hail that was one-inch in diameter. The storm damaged numerous cars, windows, and roofs. A greenhouse containing plants worth more than $250,000 was destroyed. Straight-line winds of 80 mph uprooted mature trees and damaged roofs. The storm also left 50,000 residents without power. To date, Rocky Mountain Insurance Information Association (RMIIA) has identified $767.6 million in damages from the storm.

Most expensive hailstorms in the Denver Metro region[7]:

Date	Location	Cost (2013 $)
July 20, 2009	Denver Metro	$832,854,095
July 11, 1990	Denver Metro	$1,113,987,184
June 6-15, 2009	Denver Metro	$383,308,338
June 13-14, 1984	Denver Metro	$618,827,064
October 1, 1994	Denver Metro	$353,679,656
July 13, 2011	CO Front Range	$170,881,461
June 8-9, 2004	Denver Metro	$181,284,696
August 11, 1997	Denver Metro	$185,785,022
May 22, 1996	Denver Metro	$181,139,286

Lightning[8] is a luminous, electrical discharge in the atmosphere caused by the electric charge separation of precipitation particles within a cumulonimbus (thunderstorm) cloud. Thunder is the resulting soundwave caused by the sudden expansion of air heated by lightning discharge.

[7] Rocky Mountain Insurance Information Association – National Hail Statistics
[8] Denver Office of Emergency Management – Lightning Information Sheet

Three people have been killed by lightning in Denver County and 22 have been injured from 1980-2010. In a study in Denver, it was found that one out of every 52 lightning flash results in an insurance claim; while nationwide the ratio is 1:57 (NWS). With Colorado averaging 517,539 flashes per year, and an average of one insurance claim per 52 strikes, the state is averaging about 10,000 insurance claims per year. In addition to direct damages from lightning, wildfire ignition is of great concern.

Tornado can be defined as a localized, violently destructive windstorm occurring over land, especially in the midwestern United States, and is characterized by a long, funnel shaped cloud, composed of condensation and debris that extends to the ground, marking the path of greatest destruction. Tornadoes are generated by severe thunderstorms.

Most tornadoes are not powerful enough to cause widespread damage – most are weak, and according to the NWS, 89 percent have a life span of less than 10 minutes and result in less than five percent of tornado fatalities. These weaker tornadoes typically have wind speeds less than 110 mph, which will damage a wood-frame construction home, but may completely destroy a mobile home or outbuilding.

Of the 10 percent of tornadoes that are considered strong, some may last 20 minutes or more and cover distances in excess of 20 miles. These major tornadoes can have speeds to 165 mph, account for 30 percent of tornado deaths, and will cause considerable damage to almost any type of structure.

The remaining one percent of tornadoes are considered violent in nature and result in 70 percent of tornado fatalities. They destroy everything in their path, can last more than an hour,and travel more than 50 miles. The only chance for survival in a violent tornado is inside a safe room or underground shelter.

From 1950 to 2010, there were 14 reported tornados in Denver County. There have been 13 injuries, no deaths, and total approximate damage from these 14 tornados was $32,575,000. Compared with other states, Colorado ranks number 10 for frequency of tornados. The high altitude and drier air make it harder for the monster supercells that spawn the biggest tornados to form. Most of our tornados are small and short-lived. Since 1950, the three counties with the most tornados have been Weld County, Adams County, and Washington County.

Tornados reported for Denver County[9]:

Date	Time	Deaths	Injuries	Category
April 11, 1966	1200	0	0	F0
June 9, 1967	1150	0	0	F1
May 28, 1981	1648	0	0	F1
June 3, 1981	1425	0	0	F2
June 3, 1982	1436	0	0	F0
June 8, 1986	1710	0	6	F2
May 12, 1987	1705	0	0	F1
June 12, 1987	1440	0	0	F0
June 15, 1988*	1616	0	0	F2
June 15, 1988*	1624	0	7	F3
May 29, 1990	1231	0	0	F0
June 2, 1993	1230	0	0	F1
July 9, 1996	1525	0	0	F0
May 26, 2010	1330	0	0	EF0**

* June 15, 1988: a tornado outbreak occurred in metro Denver with five tornados resulting in seven injuries and damage in excess of $15M.
** The standard Fujita (F) scale was updated in 2006 to the "Enhanced Fujita" (EF) scale.

The peak season is mid-May through mid-August, with June being the most active month. However, there is no hard and fast rule for when tornadoes strike, as Colorado witnessed on March 29th, 2007 when Holly, Colorado was struck by an EF-3 tornado with winds of 165 mph. Two women lost their lives as a result of that event and 160 homes were damaged.

Flooding[10]

A flood is a general and temporary condition of partial or complete inundation of normally dry land areas from: (1) the overflow of stream banks, (2) the unusual and rapid accumulation of runoff of surface waters from any source, or (3) mudflows or the sudden collapse of shoreline land. Flooding results when the flow of water is greater than the normal carrying capacity of the stream channel or accumulates faster than surface absorbency allows. The floodplain is land adjoining the channel of a river, stream, lake, or other water body that is susceptible to flooding.

The causes of floods relate directly to the accumulation of water from precipitation, rapid snowmelt, or the failure of human-made structures, such as dams or levees. Floods caused by precipitation are further classified as coming from:

- Rain in a general storm system
- Rain in a localized intense thunderstorm
- Melting snow
- Rain on melting snow
- Ice jams

[9] Tornado Project Online – Colorado Tornadoes 1950-2011 – Denver County Tornadoes
[10] State of Colorado – Colorado Natural Hazards Mitigation Plan – December 2013

Denver has a history of large and small magnitude flooding. The most damaging flood in Colorado occurred in June 1965 on the South Platte River when over $2.9 billion in damages (2013 dollars) were sustained in the Denver metro area.

Floods of large magnitude in Denver:

Year	Location	Deaths	Damage (2013 $)
1973	South Platte River	10	$567,707,676
1965	South Platte River	8	$2,922,851,401
1912	Cherry Creek	2	$175,371,084
1864	Cherry Creek	0	$7,869,215

Small magnitude flooding also has the potential for loss of life and damage, and is most likely what we face in Denver. The threat to life in Denver by flooding has been greatly diminished thanks to extensive mitigation projects and the creation of the Urban Drainage and Flood Control District in 1969. However, six years ago, a small magnitude flood on Lakewood Gulch in Denver claimed the life of a child. Due to the unpredictability of storms, we can't rule out the continued threat to life from flash flooding.

In the past, problem areas included Cherry Creek. The building of the Cherry Creek Flood Control Reservoir in 1950 alleviated most of this problem. The last flash flooding events occurred September 12th-13th, 2013 in several low-lying areas throughout Denver County, but there was no significant damage.

Harvard Gulch was another problem area. Prior to 1965, Harvard Gulch experienced regular flooding due to summer thunderstorms. The Harvard Gulch Flood Control Project, completed in 1966, was designed for the 10-year flood and has alleviated this problem. The largest flood event since the completion of the project occurred on June 8th, 1969. The flow was confined within the drainage improvements. There remains a continued threat to property from flash flooding along Harvard Gulch, Goldsmith, and Westerly Creek.

Terrorism and Directed Mass Violence (excluding civil disorder)

Terrorism is the use of force or violence against persons or property in violation of the criminal laws of the United States for purposes of intimidation, influence, coercion, or ransom. Terrorists often use threats to:

- Create fear among the public;
- Try to convince citizens that their government is powerless to prevent terrorism;
- Get immediate publicity for their causes.

Terrorism generally is a tool used by a group or organization to draw attention to a political or social issue. In recent decades, violent terrorism has been demonstrated globally in the form of attacks on civilian populations, transportation infrastructure, financial infrastructure, and government facilities. The most common tactic used by terrorists has been the employment of explosive devices and the use of firearms. Homeland security advisories indicate international terrorists continue seek resources to conduct attacks using conventional and non-conventional weapon systems, including chemical, biological, and nuclear.

In the state of Colorado, international and domestic terrorist groups are present. The following international groups have known links in Colorado: Hamas, Hezbollah, MS13, Al Jihad, and Al Qaeda. The following domestic groups are known to have links in Colorado: street gangs, National Alliance (Neo-Nazi), Neo-Confederate, KKK, Constitutionalists, Animal Liberation Front (ALF), the Earth Liberation Front (ELF), and outlaw motorcycle gangs, including Hells Angels, Banditos, and Nazi Low Riders. All of these groups pose threats to life and property within Denver and cannot be overlooked in a hazard profile.

Lone wolves have also conducted terrorist attacks in the United States and cannot be discounted as a threat in Denver. A lone wolf is someone who commits violent acts in support of a group, movement, or ideology, but does so alone, outside of any command structure. There has been an increase in lone wolves acting on behalf of Al Qaeda within the United States over the past five years.

Aside from organized terrorism, school campuses have recently become a more targeted location for mass violence, specifically mass shootings. Reasons spanning from anger, jealousy, depression, and psychosis, some attackers chose to carry out deadly violence on school campuses, whether they are targeting specific people or just random victims.

Shootings that have occurred on school campuses in Colorado since 1961:

Event	Location	Date	Injuries	Deaths
Morey Jr. High School Shooting	Denver, CO	10/17/1961	1	1
Deer Creek Jr. High School Shooting	Littleton, CO	4/7/1982	0	1
Columbine High School Massacre	Littleton, CO	4/20/1999	21	15
Platte Canyon High School Hostage Crisis	Bailey, CO	9/27/2006	0	2
Deer Creek Jr. High School Shooting (2)	Littleton, CO	2/23/2010	2	0
Arapahoe High School Shooting	Centennial, CO	12/13/2013	0	2

Winter Storms (excluding hail)

Hazardous winter weather includes events related to heavy snow, blowing snow, ice, sleet or freezing rain, and extreme cold temperatures. Blizzards are severe winter storms that pack a combination of blowing snow and wind resulting in very low visibility. While heavy snowfall and severe cold often accompany blizzards, they are not required. Sometimes strong winds pick up snow that has already fallen, creating a blizzard. Hazardous winter weather may also result from bitterly cold temperatures and may not involve snow.

Two of the past four presidential emergency declarations in Colorado have been related to severe winter weather events. In 2003, Colorado received a presidential declaration for snow emergency for the snowstorms of March 17th through the 20th and again in 2007 for the storms in December 2006. Denver received monetary support for both of those events.

Past significant winter storms in Denver include[11]:

- November 1983 – extreme cold with temperatures 21 degrees F below zero (coldest recorded temperature in over 20 years); storm unexpectedly lingered over Denver with 21.5 inches of snow.
- November 1991 – snowstorm with 21.1 inches of snow.
- October 1997 – blizzard with more than 31 inches of snow; 4,000 travelers were stranded at Denver International Airport (DIA), costing air carriers more than $20 million. Colorado declared a state emergency.
- December 1998 – extreme cold. For six days, temperatures fell below zero degrees F with a low of -19 degrees F. There were power outages, cracked water pipes, five deaths, and 15 injuries reported from this storm.
- April 2001 – DIA lost power two times in two consecutive weekends due to two severe spring storms; high winds and ice snapped power poles and downed power lines, leaving many residents and businesses without power.
- March 2003 – largest snowstorm since 1946 with 31.8 inches of snow.
- December 2006 – Multiple storms and below-normal temperatures generated 20.7 inches of snow, creating severe ice buildup on local streets. The first storm occurred on December 20th, closing grocery stores, retailers, the airport, the City of Denver, and mail service at the height of the holiday season. A state-wide disaster was declared.

[11] State of Colorado – Colorado Natural Hazards Mitigation Plan – December 2013

SECTION 3: HOW CRITICAL THREATS AND HAZARDS WILL AFFECT AHEC

In Section 2, threats and hazards that are common to Denver County were identified and defined by potential and historical effects to this region. In this section we will identify how the most critical threats and hazards identified could potentially affect the Auraria Campus.

Fixed Hazards

Energy Disruption

The Denver area and the Auraria Campus does experience occasional power loss for different reasons. The most recent power loss on campus was due to Xcel Energy working on the power grid on campus. Other reasons come from scheduled outages for maintenance, weather-related power system damage, mechanical failures, or human-related incidents, such as vehicle accidents involving power lines or transformers.

Energy loss on campus is a critical hazard to classroom function and operations. Depending on the time, duration, and frequency of energy loss, this hazard can also be detrimental to revenue for the schools and vendors based on campus. The main mitigating strategy for energy loss on campus is power generators affixed to the buildings.

List of generators on campus:

Building	KW	Manufacture Date	Fuel Type	Tank Capacity
Administration	40	11/86*	Diesel	40
Facilities Services	80	10/08	Diesel	500
Facilities Services - Annex	40	9/08	Diesel	325
Hospitality Learning Center	100	2/12	Diesel	240
King Center	125	8/99	Diesel	193
North	450	5/07	Diesel	450
North – Roof	250	11/85	Diesel	350
PE/Events Center	100	9/08	Diesel	610
Science	500	1/09	Diesel	746
Cherry Creek	80	10/08	Diesel	500
Student Success Building	150	4/11	Diesel	308
Seventh Street Garage	230	12/90	Diesel	275
Boulder Creek	40	2/90	Diesel	53
Tivoli	400	5/05	Diesel	583

* The generator for the Administration Building was a repurposed (used) unit when installed.
note – *Yellow highlighted cells indicate points of concern regarding a generator's age and/or capacity to power the building it is assigned.*

Hazardous Materials Incident – On-Campus / Fixed Facility Off-Campus

note – *There have been no hazardous material incidents on- or off-campus that have caused property damage or significant bodily injury on the Auraria Campus. The following hazardous material data is only identified to document potential risk.*

On-Campus: There are several hazardous materials identified, but this report will only address materials that are overtly hazardous to health and safety of people and/or environment due to either (1) large quantity of said material, or (2) high volatility/toxicity of said material.

Large Quantity

Material	Location	Quantity (in Gallons)	Hazardous Effects
Mineral Oil	1041 9th Street	163	**Fire Hazard** – Slight; Poisonous gases are produced in a mineral oil fire. **Acute Health Hazard** – Can irritate the skin causing a rash or burning sensation on contact. **Chronic Health Hazard** – Breathing mineral oil can irritate the lungs, causing coughing and/or shortness of breath.
	1050 9th Street	163	
	Administration Building	650	
	Central Classroom	540	
	Child Care Center	440	
	Child Development Center	215	
	Chiller Plant North	540	
	Chiller Plant South	135	
	Emmanuel Gallery	324	
	Facilities Annex	135	
	Facilities Management	135	
	King Center	200	
	Library / Media Center	273	
	Library / Media Center	273	
	Parking and Transportation Center	260	
	PE / Event Center	433	
	Plaza Building	660	
	Science	600	
	Seventh Street	272	
	South Classroom	435	
	South Classroom	435	
	St. Cajetan's	163	
	St. Francis	215	
	Technology	435	
	Tivoli	1305	
	Tivoli Auraria Parking Structure (TAPS)	215	
	West Classroom	440	

Material	Location	Quantity (in Gallons)	Hazardous Effects
Automatic Transmission Fluid (ATF)	Facilities Annex	55	**Fire Hazard** – Slight; Poisonous gases are produced in an ATF fire. **Acute Health Hazard** – Can irritate the skin causing a rash or burning sensation on contact. **Chronic Health Hazard** – Breathing ATF can irritate the lungs causing coughing and/or shortness of breath.
Motor Oil	Facilities Annex	55	**Fire Hazard** – Slight **Acute Health Hazard** – This material may cause mild skin and eye irritation **Chronic Health Hazard** - Prolonged or repeated contact or exposure to vapors or mists may cause redness and burning, with drying and cracking of the skin.
Diesel Fuel	Facilities Annex	55	**Fire Hazard** – Combustible liquid and vapor may cause flash fire. **Acute Health Hazard** – Slightly irritating to the eyes; may cause respiratory tract irritation. Inhalation causes headaches, dizziness, drowsiness and nausea, and may lead to unconsciousness. **Chronic Health Hazard** – Prolonged or repeated contact can defat the skin and lead to irritation and/or dermatitis.
	Facilities Annex	250	

Material	Location	Quantity (in Gallons)	Hazardous Effects
Motor Oil - Waste	Facilities Annex	200	**Fire Hazard** – Slight **Acute Health Hazard** – This material may cause mild skin and eye irritation. **Chronic Health Hazard** - Prolonged or repeated contact or exposure to vapors or mists may cause redness and burning with drying and cracking of the skin; used motor oil is a possible skin cancer hazard based on tests in laboratory animals and has been identified as a possible carcinogen by IARC.
Gasoline	Facilities Annex	3000	**Fire Hazard** – Extremely flammable liquid and vapor; this material is combustible/flammable and is sensitive to fire, heat, and static discharge. **Acute Health Hazard** – May be fatal if swallowed and enters airways; causes skin and eye irritation; may cause drowsiness or dizziness. Extreme exposure, such as intentional inhalation, may cause unconsciousness, asphyxiation, and/or death. **Chronic Health Hazard** – Suspected of causing blood cancer if repeated over-exposure by inhalation and/or if skin contact occurs; repeated or prolonged skin contact can cause irritation and dermatitis; may cause damage to liver, kidneys, and nervous system by repeated and prolonged inhalation or skin contact.

High Volatility/Toxicity – Science Building Lab

note – *The table below only lists materials **over** five pounds that meet the "any quantity" requirement under the Screening Threshold Quantity (SQT) set by DHS's Chemical Facilities Anti-Terrorism Standards (CFATS) regulations.*[12]

Material	Quantity (in pounds)	Hazardous Effects
Dynamic Descaler	263.6236625	**Fire Hazard** – None **Acute Health Hazard** – Irritating to eyes and may cause damage if not rinsed with water; Tingling or a slight burning sensation of the skin with prolonged exposure or to pre-existing cuts and abrasions; if ingested, may cause damage to the mouth, esophagus, and stomach, resulting in vomiting, headache, and other medical problems; Ii inhaled, may cause coughing, sneezing, and minor upper respiratory irritation. **Chronic Health Hazard** – Overexposure to some hazardous ingredients in this product has been found to affect certain body organs and systems in experimental animals and/or humans. These include: gastrointestinal tract, mucous membrane, skin, eyes, and respiratory system.
Hydriodic Acid	7.683002944	**Fire Hazard** – None **Acute Health Hazard** – Severe breathing irritation and lung congestion; skin and eye irritation and burns; severe gastrointestinal irritation and burns if ingested. **Chronic Health Hazard** – Same as Acute Health Hazards.

[12] DHS - Identifying Facilities Covered by the Chemical Security Regulation

Material	Quantity (in pounds)	Hazardous Effects
Hydrobromic Acid	9.243226741	**Fire Hazard** – None **Acute Health Hazard** – Extremely hazardous with skin contact (corrosive, irritant), eye contact (irritant), ingestion, and inhalation. Liquid or spray mist may produce tissue damage, particularly on mucous membranes of eyes, mouth, and respiratory tract. Skin contact may produce burns. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Inflammation of the eyes is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or blistering. **Chronic Health Hazard** – Extremely hazardous with skin contact (corrosive, irritant), eye contact (irritant), ingestion, and inhalation. Repeated or prolonged exposure to the substance can produce organ damage. Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray mist may produce respiratory tract irritation, leading to frequent attacks of bronchial infection. Repeated or prolonged inhalation of vapors may lead to chronic respiratory irritation.
Hydrochloric Acid	398.1275508	**Fire Hazard** – None **Acute Health Hazard** – Very hazardous with skin contact (corrosive, irritant, permeator), eye contact (irritant, corrosive), and ingestion; slightly hazardous with inhalation (lung sensitizer); non-corrosive for lungs. Liquid or spray mist may produce tissue damage particularly on mucous membranes of eyes, mouth, and respiratory tract; skin contact may produce burns; inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath; severe over-exposure can result in death. Inflammation of the eyes is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or blistering. **Chronic Health Hazard** – Slightly hazardous with skin contact (sensitizer). The substance may be toxic to kidneys, liver, mucous membranes, upper respiratory tract, skin, eyes, circulatory system, and teeth Repeated or prolonged exposure to the substance can produce organ damage; Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray mist may produce respiratory tract irritation, leading to frequent attacks of bronchial infection. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

Material	Quantity (in pounds)	Hazardous Effects
Thionyl Chloride	5.365523	**Fire Hazard** – None **Acute Health Hazard** – Very hazardous with skin contact (irritant), eye contact (irritant), ingestion, and inhalation. Hazardous with skin contact (corrosive, permeator), eye contact (corrosive). Liquid or spray mist may produce tissue damage, particularly on mucous membranes of eyes, mouth, and respiratory tract. Skin contact may produce burns. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Severe overexposure can result in death. Inflammation of the eyes is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or blistering. **Chronic Health Hazard** – The substance may be toxic to upper respiratory tract, skin, and eyes. Repeated or prolonged exposure to the substance can produce organ damage. Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray mist may produce respiratory tract irritation, leading to frequent attacks of bronchial infection. Repeated exposure may produce general deterioration of health by an accumulation in one or many human organs.
Triethyl Phosphite	5.97911	**Fire Hazard** – Combustible liquid and vapor; may react on contact with water. **Acute Health Hazard** – Lung, skin, and eye irritation. Ingestion hazard unknown. **Chronic Health Hazard** – Same as Acute Health Hazards.

Off-Campus: There are many fixed facilities in close proximity of the Auraria Campus that store reportable amounts of Hazardous Materials, but this report will only address the Emergency Planning and Community Right-to-Know Act (EPCRA), Tier II Facilities[13] **within one mile of the Auraria Campus.**

Material	Reporting Facility	Direction from Campus
Calcium Chloride, Calcium Nitrate, Sodium Nitrate	Lafarge Quivas Ready Mix Plant	South
(available only by individual request)	Denver Water – Westside Facility	South
(available only by individual request)	Union Pacific Railroad – Burnham Shop Yard	South
(available only by individual request)	Regional Transportation District Light Rail Maintenance Facility	South
Chlorine	Superior Pool Products, LLC	South
(available only by individual request)	General Air Service and Supply	South
Sulfuric Acid (Bulk Lead Batteries)	SunGard Availability Services	South
Sulfuric Acid (Bulk Lead Batteries)	Xcel Energy – Zuni Electric Generating Station	South
Sulfuric Acid (Bulk Lead Batteries)	Comcast Mile High Cable Partners – Mile High Stadium	West
Sulfuric Acid (Bulk Lead Batteries)	Verizon Wireless – Avalanche	North
(available only by individual request)	Regional Transportation District – Blake Street and Market Street	North
(available only by individual request)	Kiewit Western Co. / RTD – Union Station	North
(available only by individual request)	Xcel Energy Larimer PSCo	North
Sulfuric Acid (Bulk Lead Batteries)	Denver EPA OC, LLC	North
Sulfuric Acid (Bulk Lead Batteries)	AT&T Mobility - USID115245	North
Sulfuric Acid (Bulk Lead Batteries)	Xcel Energy - Denver Steam Plant	North
Sulfuric Acid (Bulk Lead Batteries)	MCI dba Verizon Business- DEFMCO	East
Sulfuric Acid (Bulk Lead Batteries)	ViaWest, Inc.	East
Sulfuric Acid (Bulk Lead Batteries)	Level 3 Communications - Denver (GC)	East
Sulfuric Acid (Bulk Lead Batteries)	AT&T - CO1313	East
Sulfuric Acid (Bulk Lead Batteries)	Qwest Denver Main Central Office	East
Gasoline, Diesel	Anadarko Petroleum Corporation	East

[13] Environmental Protection Agency – EPCRA Sections 311-312

Material	Reporting Facility	Direction from Campus
(available only by individual request)	Xcel Energy - Denver Chilled Water Center	East
(available only by individual request)	United States Mint at Denver	East
(available only by individual request)	Regional Transportation District Civic Center Station	East

note – *Some materials are not listed in HAZUS due to additional propriety restrictions. These materials may be identified via a formal request to the Denver LEPC for each reporting facility. For the facilities in the above table that did not list their reporting materials, Denver Fire Department was consulted and confirms the materials not listed do not pose an immediate risk to the Auraria Campus*.

Structure Fires

note – *There have been no structure fires that have caused property damage or significant bodily injury on the Auraria Campus in the last five years. The following fire safety data is only identified to document potential risk.*

There are many different building types for the structures on the Auraria Campus. The most common is masonry or jointed masonry, both of which make up most of the instructional and classroom space on campus. Others building types on campus include frame, metal, modular, reinforced concrete columns and beams, and wood or steel studs in bearing wall.

There are many causes of structure fires. From 2007-2011, the primary causes of nonresidential/occupied building (includes educational institutions) fires in the United States[14] are as follows (in order of prevalence, #one being the most common):

1. Cooking (almost three times more common than the next cause)
2. Intentional
3. Other unintentional, careless
4. Electrical malfunction
5. Heating

To help prepare and mitigate fire hazards on campus, AHEC Facilities Services maintain a robust fire protection/prevention program, which includes fire alarm and sprinkler systems, fire extinguishers (placement as mandated by NFPA), directional signage, and regular building and equipment inspections. To protect life safety on campus, AHEC also has Campus Emergency Procedures that are given to every Student and Staff member during orientation, and are available in every office and classroom on campus. Fires are one of the emergencies addressed in the procedures. Regularly scheduled fire alarm tests are conducted in the buildings throughout the campus, and many of the offices and facilities on the Auraria Campus have evacuation plans for their department and building.

[14] U.S. Fire Administration – Nonresidential Building Fire Causes (2007-2011)

There are fire protection/preparedness deficiencies that have been identified for AHEC:

- Though there are basic evacuation plans in every classroom, and many of the staff departments/buildings have developed evacuation plans for their occupants, there are some that have not. And for those that do have evacuation plans in place, those plans are not standardized and reviewed for consistency in coordination with other evacuation plans. Some gaps in the existing plans may include:
    - Ensuring evacuee accountability for each department/floor/building;
    - Having special evacuation procedure addendums in place for persons with disabilities, and access/functional needs;
    - Establishing two rally points (one primary and one backup) that are a safe distance from the building being evacuated (experts recommend there be at least one building/structure between the evacuees and the building they just evacuated).

- Auraria Campus relies on sprinkler systems as one of the layers of fire safety, but not every building on campus has a sprinkler system. The campus' buildings that do not have a sprinkler system*:
    - Arts Building (sprinklers being installed)
    - Central Classroom (sprinklers being installed)
    - Early Learning Center and Children's College
    - Library (only the basement has sprinklers)
    - Physical Education/Event Center
    - Plaza Building
    - South Classroom
    - Technology Building
    - West Classroom (sprinklers being installed)

**For the purpose of this section's risk status, only high-occupancy buildings are listed.*

Mobile / Transportation Hazards

Commercial Haul Traffic

Interstate 25

Interstate 25 (I-25) curves around the Auraria Campus, less than ¼-mile distance from the west and north boundaries of the campus. This part of I-25 is a high-traffic corridor for both private and commercial vehicles. I-25 in Colorado has had several hazardous materials incidents as a result of motor vehicle accidents:

- March 15, 2011 (I-25 south of Castle Rock) – Three-car accident involving an oversized tanker carrying diesel fuel. The accident caused a breach in the tanker, releasing over 1000 gallons of diesel fuel. Fire Department and HazMat crews worked five hours to spot the spill and clean the area.
- August 8, 2012 (I-25 and U.S. 35 in Loveland) – A semi with a flatbed trailer hauling two other trucks overturned on the highway causing a significant diesel fuel spill. The highway was closed for several hours until the State Patrol HazMat Unit could clean the

spill.

- August 14, 2013 (I-25 south of County Rd. 8 in Weld County) – A truck driver hauling a mixed load of hazardous materials (flammable, corrosive, and other dangerous liquids with toxic materials) called 911 to inform emergency services that his load was leaking. It took HazMat Teams almost five hours to stop the leak and clean up the contaminated area.

Commercial Rail Traffic

The Burlington Northern Santa Fe (BNSF) Railway operates busy freight lines very close to the Auraria Campus. Similar to I-25, the BNSF rail lines wrap around the campus from the south, around the west, and then to the north boundaries. The rail lines have close proximity (within 50 feet) to campus areas with heavy foot traffic. Although there has never been a major rail accident in close proximity to campus, Colorado has had rail accidents occur in recent history, some involving major hazardous materials spills:

- April 3, 1983 (Denver) – Denver and Rio Grande Western Railroad Company train yard accident involving punctured yank car, nitric acid, and a vapor cloud.
- April 13, 1984 (East Wiggins) – Head-on collision of Burlington Northern Railroad Freight Trains
- August 2, 1985 (Westminster) – Head-on collision of Burlington Northern Railroad Company Freight Trains Extra 6311 West and Extra 6575 East
- February 21, 1996 (Tennessee Pass) – Derailment of train with release of 51,606 gallons of sulfuric acid and 19,733 gallons of triethylene glycol, both regulated hazardous materials.

Because of the close proximity to the campus, there should be policies and efforts in place to prepare for a potential hazardous materials incident that occurs on I-25 or the BNSF rail lines.

Light Rail or Bus Accident – Mass Casualty Incident

The Auraria Campus is host to several RTD pick-up/drop-off points for both light rail and bus lines. With such direct interaction with mass transit comes the potential for accidents involving mass casualties.

2013 RTD accidents on or near the Auraria Campus[15]:

Date	Location	Bus/Train	Injuries/Property Damage (PD)
01/28/2013	W. Colfax & 7th Street	Train	Vehicle / PD
09/27/2013	W. Colfax & 7th Street	Train	Vehicle / PD
10/23/2013	Larimer St. & Speer Blvd.	Bus	1 injury (pedestrian)
11/09/2013	Speer Blvd. & Stout St.	Train	Poss. contact with cyclist. No evidence found. Cyclist left scene.
12/04/2013	W. Colfax & 7th Street	Train	Vehicle / PD
12/14/2013	Speer Blvd. & Stout St.	Train	Vehicle / PD

[15] Data provided by RTD Safety and Environmental Division

Though these were all minor injury or property damage events, there is always the possibility for a more catastrophic incident:

- Train derailment at the sharp curve of the west campus interchange;
- Bomb set off on a crowded bus or train at one of the Auraria stops;
- Bus accident where it loses control on the icy road and runs over people gathered at the bus stop.

All of these incidents have happened at one time or another throughout the U.S., which makes them hazards to be prepared for here. Even though the Auraria Campus has limited medical response capabilities, and relies on Denver Fire and EMS for medical emergencies on campus, a mass casualty incident of 15 or more critical patients will easily overwhelm first responders. Preparedness in how to react and support such situations can mean the difference between the life and death of a student, faculty/staff member, or visitor passing through the campus.

Situational Hazards

Civil Disorder

Being an open college campus in the middle of an urban area, located close to two major professional sports venues, the Auraria Campus is subject to occasional events of civil disorder. A well-trained campus police department who coordinates and regularly shares resources with Denver Police Department has been a very capable prevention and protection force against civil disorder incidents on campus. Fixed emergency phones strategically placed throughout the campus grounds that call directly to ACPD emergency dispatch is another layer of safety for preventing injury and property damage as a result of civil unrest.

Though these resources cannot always prevent civil disorder incidents on campus, they are highly effective tools in mitigating a riotous situation from growing or spreading, and the quick response of a well-trained force greatly reduces the harm that can be done by an unruly group intent on inflicting damage to persons and property.

Previous acts of civil disorder on the Auraria Campus with property damage and/or injuries:

Incident / Year	Approx. Cost of Damage
Denver Broncos Super Bowl Win – 1998	$8-10,000 per event
Denver Broncos Super Bowl Win – 1999	
Colorado Avalanche Stanley Cup Win – 2001	

Disease Outbreak

University campuses draw students and faculty from all over the world. These travelers can unintentionally bring viruses and disease with them from their home origins without even knowing they are sick. These illnesses can be quite common in their countries, resulting in their bodies developing a strong resistance to the virus or bacteria, but can easily transmit to a person whose immune system is weak, or whose body is not resistant to the foreign disease.

Other reasons school campuses easily transmit infectious illnesses are because of the community concept of student life where social distancing is limited. The use of shared space where potentially hundreds of students utilize the same desks, chairs, door handles, stairway rails, etc. can create a breeding ground for bacteria and viruses.

Meningococcal Disease had a record number of cases (24 and 22 respectively) in 2009 and 2010 in Colorado, resulting in six deaths from the disease in 2010[16]. One of those deaths was a Metropolitan State University of Denver student. Meningococcal Disease is only one of many highly infectious, highly aggressive illnesses that has the potential of becoming an epidemic on a college campus.

Earthquake

Even though there no fault line that runs through Denver, there is one in close proximity to the region near the Rocky Mountain Arsenal just northeast of Denver.

By running a scenario on HAZUS for a 6.25 magnitude earthquake originating from the Rocky Mountain Arsenal, a series of maps were generated for Denver County showing different areas and how they would be affected.

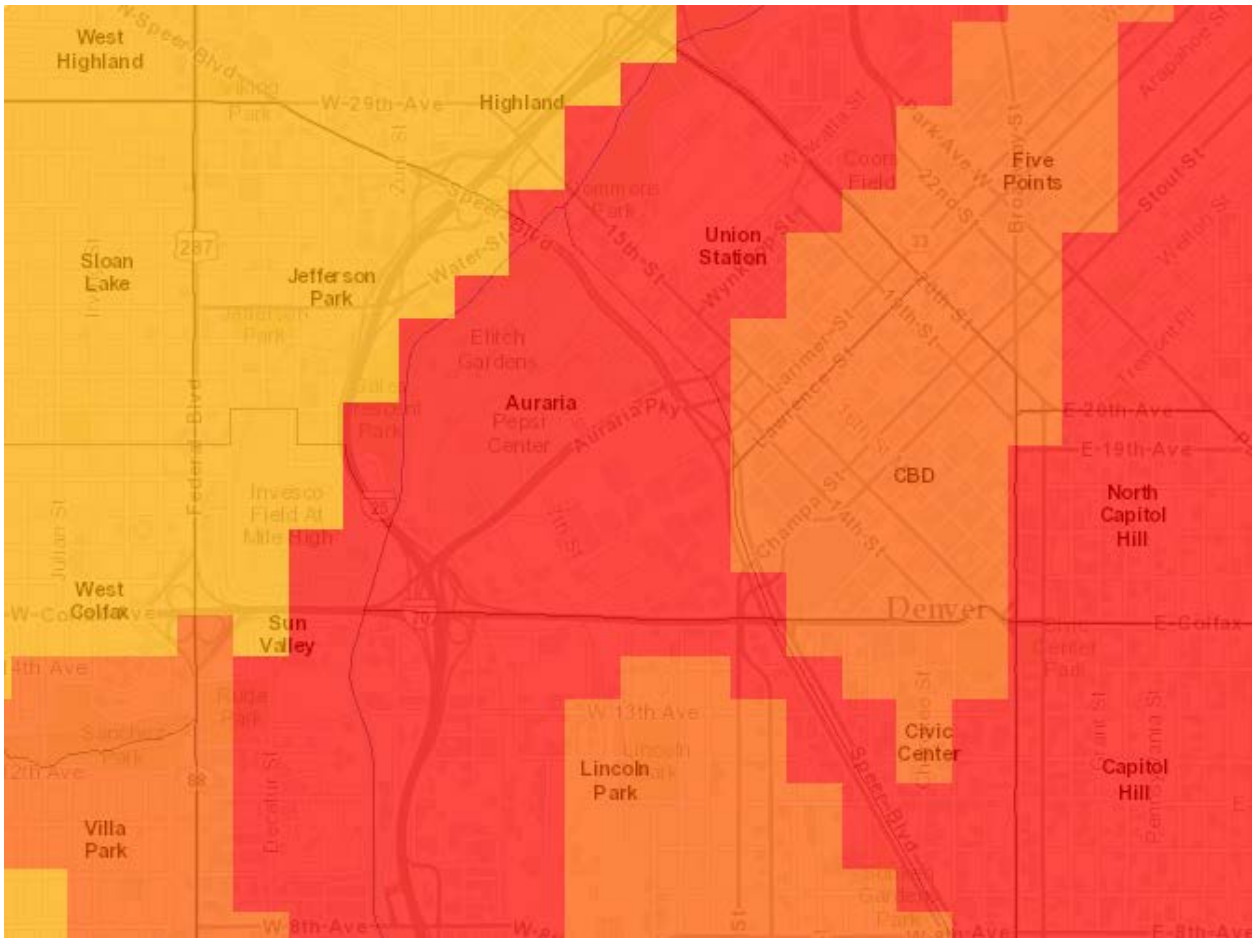
[16] Colorado Department of Public Health and Environment Meningococcal Disease Report 2009, 2010

Map 1: Potential Building Damage

This map shows potential building damage for the scenario given above. The orange buildings in the upper right-hand corner (on the east side of Speer Blvd.) represent "moderate" damage, where the buildings in red on campus represent "heavy" to "very heavy" damage.

Map 2: Shake Map

A "shake map" shows where the different intensities of undulation would occur for the scenario given above. This explains why Auraria Campus would sustain heavier building damage. The area directly to the west of campus (Jefferson Park and beyond) would experience "very strong" shaking. The area just to the east (and south) of campus would experience "severe" shaking. The areas that are shown in bright Red (to include Auraria Campus) will experience "violent" shaking (up to 116 centimeters per second [cm/s]).



Though the potential for such a quake occurring in this location and magnitude is remote, it is still a possibility. An earthquake that originated in northwestern Colorado in 1882 recorded an intensity of 6.6 magnitude.

Extreme Heat

Though rare in the Denver area, extreme heat is a notable hazard. Particularly because it happens very seldom, a heat wave of several days reaching 100+ degree temperatures could be a serious hazard considering people in this region are not prepared for it. The average number of 90 and higher degree-days per in Denver is 33.

All of the buildings on the Auraria Campus used for education, classroom, and office space are air conditioned to regulate a comfortable temperature indoors during periods of extreme heat. The Facilities Services staff are prepared to maintain and repair HVAC systems in any of the Auraria Campus buildings. However, there are no formal plans in place for continuing operations in a specific building should it lose HVAC capabilities for an extended period of time during a heat wave.

Extreme Weather Hazards (excluding heat and winter) – Hail, Lightning, Tornadoes

Hail, **Lightning**, and **Tornadoes** are all very common occurrences in the north central region of Colorado. As documented in Section 2 of this report, Denver County is affected by each of these extreme weather hazards nearly every year, causing considerable damage and injuries.

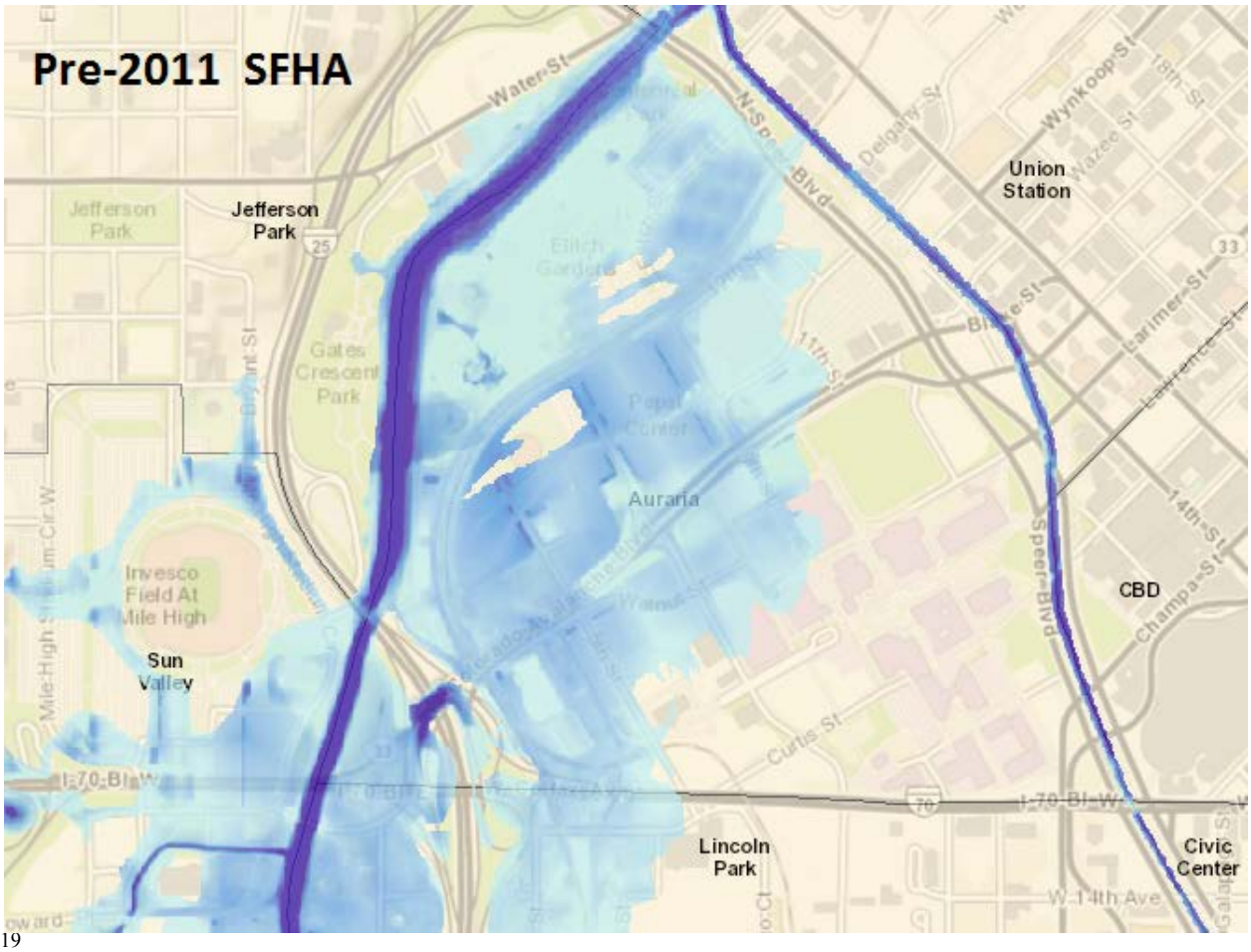
The Auraria Campus has experienced some extreme weather hazard events, but unfortunately many of the property loss records for AHEC are only kept for six years. Bruce Burgess in AHEC Procurement and Purchasing did confirm that there was a notable hail event on the Auraria Campus in the last 12-14 years that caused severe damage to trees, glass, stained glass, air conditioning units, and cooling towers. Mr. Burgess said that incident cost the campus approximately $325,000.

Unfortunately, these are not hazards we can mitigate from occurring, so the best way to combat them is by planning and training. There are procedures in place on campus outlining what should be done in case of a tornado. The City of Denver has city-wide audible tornado sirens; all buildings on campus have a dedicated tornado shelter area; and ACPD Dispatch monitors the NWS for severe weather updates. AHEC also operates the RAVE system to send out emergency information and instructions to phones and email addresses of registered students and staff if a dangerous condition on campus is eminent.

These policies, procedures, and systems must be trained, exercised and tested to ensure they work, so the affected people on campus will understand what to do should these warning efforts be activated. The systems must be maintained, and the signage for emergency exits and shelter areas must be updated frequently as the environment on campus changes from year-to-year.

Flooding[17]

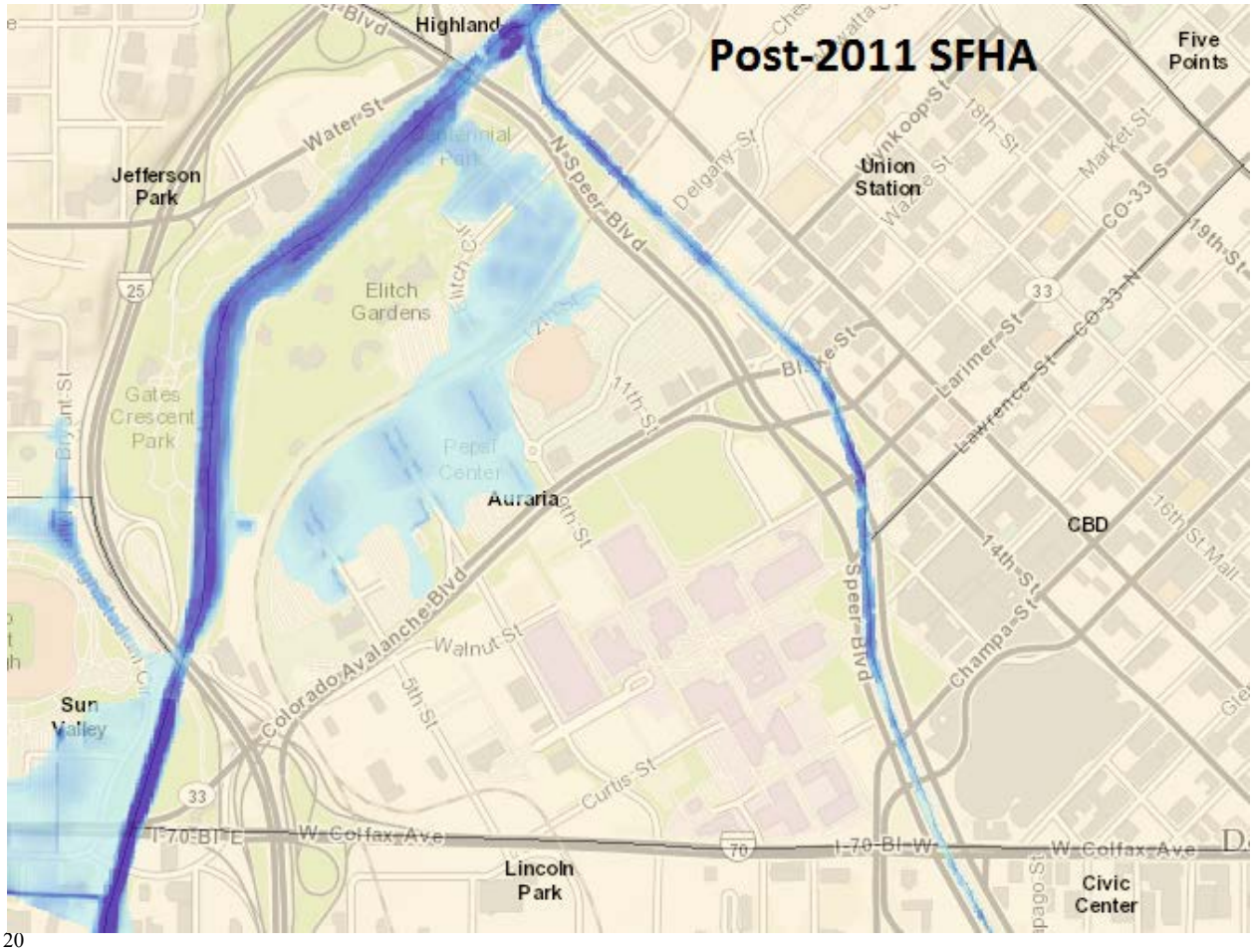
The Auraria Campus is nestled between two tributaries: the South Platte River and Cherry Creek. Because of AHEC's proximity and elevation level to these two tributaries, prior to 2011 much of the campus was located within the Special Flood Hazard Area (SFHA). An SFHA is defined as the area that would be inundated by a flood event with a one percent chance of being equaled or exceeded in any given year (also referred to as the base flood or 100-year flood zone).[18]



[19]

[17] State of Colorado – Colorado Natural Hazards Mitigation Plan – December 2013
[18] FEMA – The National Flood Insurance Program (NFIP) – Flood Zones
[19] ArcGIS HAZUS Denver County Flood Analysis (June 2011)

Post 2011, the City of Denver performed many updates and improvements on the city's drainage systems, which drastically decreased the SFHA in the area of the campus. The entire flood zone now resides north of Auraria Pkwy.



20

Terrorism and Directed Mass Violence (excluding civil disorder)

As mentioned in an earlier section, university campuses draw students and faculty from all over the world, all with different beliefs, political ideologies, and hunger for knowledge and acceptance. Although the Auraria Campus has never been an identified or confirmed as a target or base for organized terrorism, AHEC is not necessarily safe from geo-socio-political strife.

As a large, open campus in the middle of a U.S. urban city like Denver, AHEC and its stakeholders should always be mindful and prepared for a person or group who could view the campus as a "soft target," producing massive casualties with very little effort.

[20] ArcGIS HAZUS Denver County Flood Analysis (August 2013)

Concerns of directed mass violence at the Auraria Campus are fueled by two recent incidents that display the risks the campus faces.

- On July 20th, 2012, a mass shooting occurred inside a movie theater in Aurora. A gunman, wearing all tactical clothing, set off tear gas grenades in the theater and opened fire on the audience with multiple semi-automatic firearms, killing 12 and injuring 70. The gunman, James Holmes, was a former student at CU Denver (Anschutz Medical Campus). Only a year before the shooting, he had begun to show signs that he was having psychological problems. He withdrew from the university without a reason. Holmes could have chosen the Anschutz Medical Campus or Auraria Campus as his target for the violent attack.

- On November 10th, 2012, a man wearing an all-black jumpsuit, black facemask, and wielding a Samurai-style sword was reported to ACPD as walking around erratically and swinging the sword at 9th Street near the Tivoli Student Union. When the campus officer approached the subject, the man attacked the officer with the sword, forcing the officer to shoot the attacker. This incident took place before 6am on a Saturday morning. Had it been on a weekday, the subject with the sword could have attacked groups of students and staff that congregate outside Tivoli in that area.

Winter Storms (excluding hail)

Winter storms are a regular occurrence in Colorado. They are a hazard and have been the cause for several declared emergencies in this state. On campus, they are responsible for incidents such as burst water pipes, power outages, access issues (causing school closures), vehicle accidents, trip and fall injuries, and even exposure/hypothermia to those who spend excessive time outside without proper clothing or shelter.

The AHEC Facilities Services Grounds Department utilizes policies and procedures with a robust and experienced staff to deal with the hazards of winter storms. These operations are taxing on equipment and personnel, and ultimately place a burden on budget due to equipment repair, equipment replacement, and staff safety equipment to prevent injuries.

SECTION 4: AHEC HIRA DATA ANALYSIS

Using the data and localized assessments from sections 2 and 3, each hazard is rated in two categories: (1) **Life Safety**; and (2) **Property Damage and Operational Function**.

The standards by which each category is rated by are as follows:

- **Both categories' hazard potential are rated the same:**
  - The likeliness a particular hazard will affect the Auraria Campus in a given year; #1 being "Not likely at all" and #10 being "Extremely Likely"
- **Severity of Risk for Life Safety** is rated by how a particular hazard will potentially affect (harm) people on the campus
  - #1 being "Little to No Harm" and #10 being "Serious Harm/Death"
- **Severity of Risk for Property Damage and Operational Function** is rated by how a particular hazard will potentially affect long term operations of the campus and/or damage to buildings, vehicles, mechanical/electrical systems, etc.
  - #1 being "Little to No Damage and/or Effects" and #10 being "Catastrophic Damage and/or Effects"

Life Safety

Hazards vs. Risk in regard to threat against **life safety** on campus

Energy Disruption

Hazard Potential	1	2	3	4	5	6	7	8	9	10
10										
9										
8										
7										
6										
5										
4										
3	4									
2										
1										

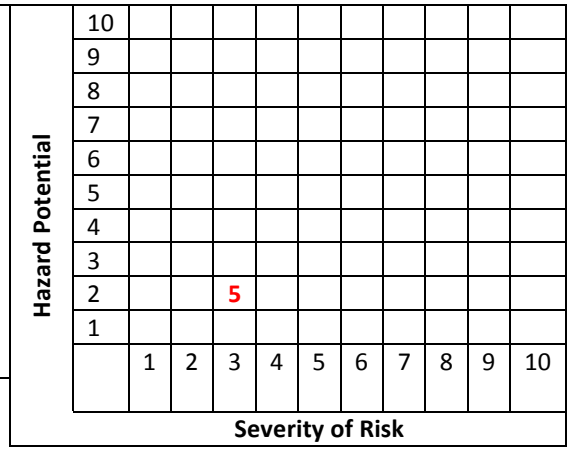
Severity of Risk

Hazardous Materials Incident

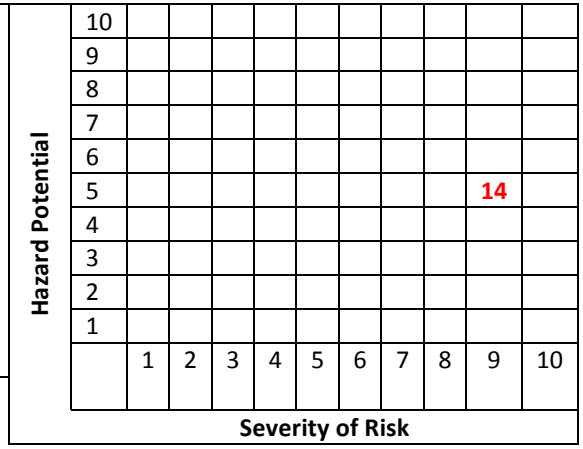
Hazard Potential	1	2	3	4	5	6	7	8	9	10
10										
9										
8										
7										
6										
5										
4										
3							10			
2										
1										

Severity of Risk

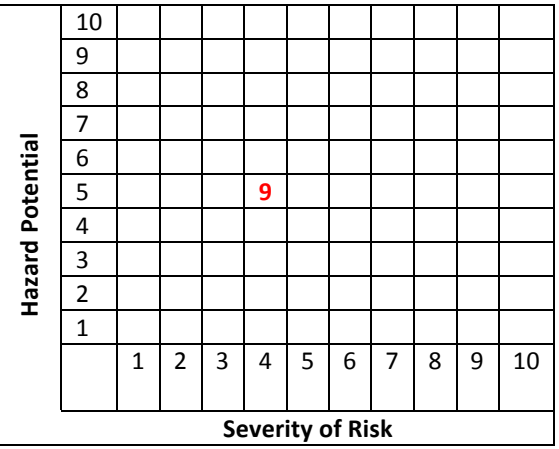
Structure Fire



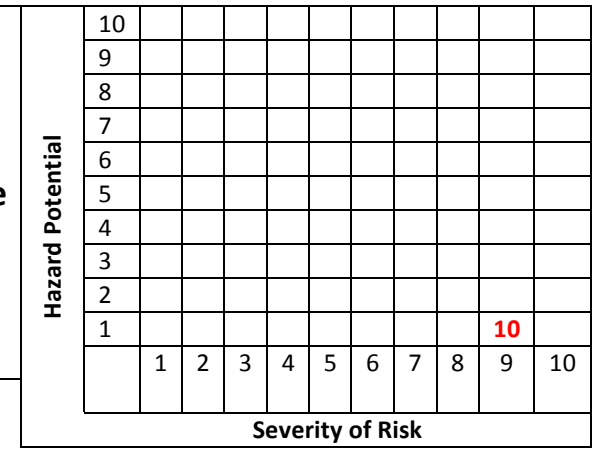
Disease Outbreak



Civil Disorder



Earthquake



Extreme Heat

Hazard Potential	1	2	3	4	5	6	7	8	9	10
10										
9										
8										
7										
6										
5										
4										
3										
2		4								
1										

Severity of Risk

Flooding

Hazard Potential	1	2	3	4	5	6	7	8	9	10
10										
9										
8										
7										
6										
5										
4										
3										
2	3									
1										

Severity of Risk

Hail, Lightning, Tornado

Hazard Potential	1	2	3	4	5	6	7	8	9	10
10										
9										
8										
7				11						
6										
5										
4										
3										
2										
1										

Severity of Risk

Terrorism, Mass Violence

Hazard Potential	1	2	3	4	5	6	7	8	9	10
10										
9										
8										
7										
6										
5										
4									13	
3										
2										
1										

Severity of Risk

Winter Storm

Hazard Potential											
10											
9	**10**										
8											
7											
6											
5											
4											
3											
2											
1											
	1	2	3	4	5	6	7	8	9	10	

Severity of Risk

Property Damage and Operational Function

Hazards vs. Risk in regard to threat against property damage and operational function on campus

Energy Disruption

Hazard Potential											
10											
9											
8											
7											
6											
5											
4											
3					**7**						
2											
1											
	1	2	3	4	5	6	7	8	9	10	

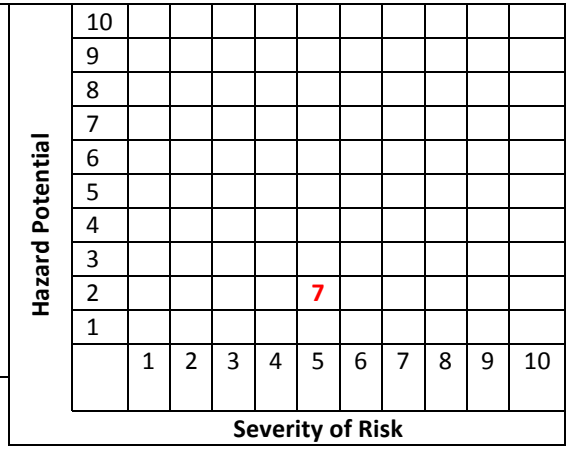
Severity of Risk

Hazardous Materials Incident

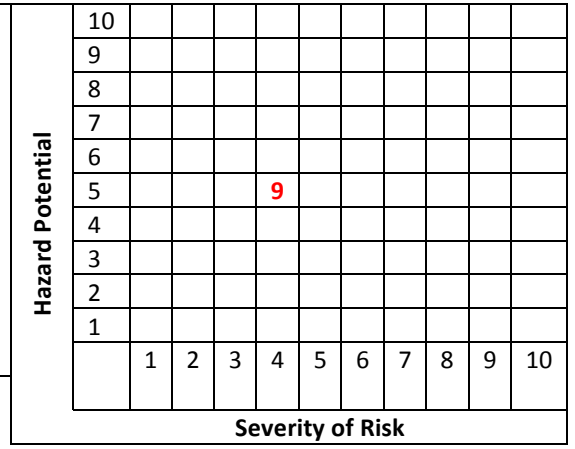
Hazard Potential											
10											
9											
8											
7											
6											
5											
4											
3			**5**								
2											
1											
	1	2	3	4	5	6	7	8	9	10	

Severity of Risk

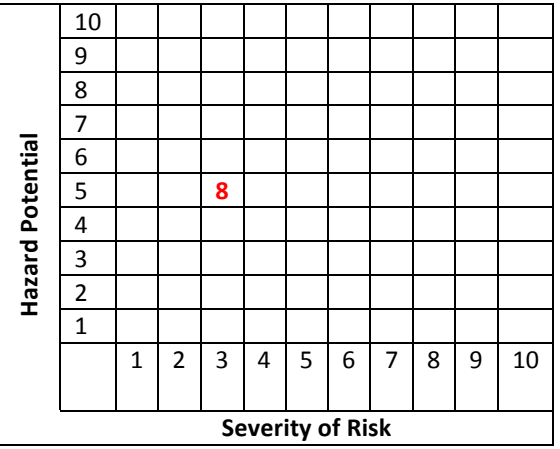
Structure Fire



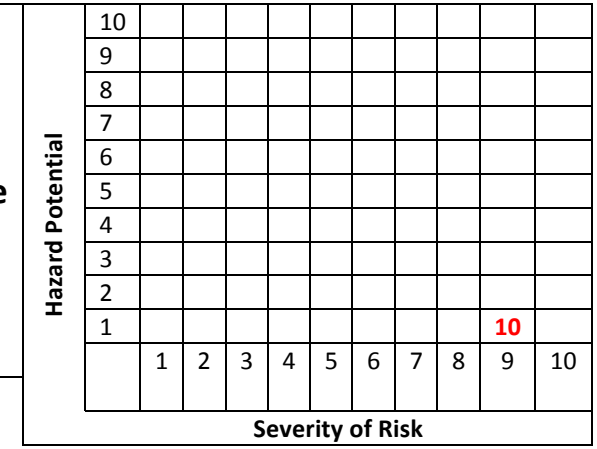
Disease Outbreak



Civil Disorder



Earthquake



Extreme Heat

Hazard Potential	1	2	3	4	5	6	7	8	9	10
10										
9										
8										
7										
6										
5										
4										
3										
2	**3**									
1										

Severity of Risk

Flooding

Hazard Potential	1	2	3	4	5	6	7	8	9	10
10										
9										
8										
7										
6										
5										
4										
3										
2		**4**								
1										

Severity of Risk

Hail, Lightning, Tornado

Hazard Potential	1	2	3	4	5	6	7	8	9	10
10										
9										
8										
7							**14**			
6										
5										
4										
3										
2										
1										

Severity of Risk

Terrorism, Mass Violence

Hazard Potential	1	2	3	4	5	6	7	8	9	10
10										
9										
8										
7										
6										
5										
4					**9**					
3										
2										
1										

Severity of Risk

Winter Storm

Hazard Potential										
10										
9	**10**									
8										
7										
6										
5										
4										
3										
2										
1										
	1	2	3	4	5	6	7	8	9	10

Severity of Risk

SECTION 5: AHEC HAZARD PRIORITIZATION

The following list is the identified hazards for the Auraria Campus and the total ratings from Section 4. These ratings will place each hazard in priority by the level of their risk.

Energy Disruption
Life Safety – 4
Property Damage/Operational Function – 7
Total – 11

Hazardous Materials Incident
Life Safety – 10
Property Damage/Operational Function – 5
Total – 15

Structure Fire
Life Safety – 5
Property Damage/Operational Function – 7
Total – 12

Civil Disorder
Life Safety – 9
Property Damage/Operational Function – 8
Total – 17

Disease Outbreak
Life Safety – 14
Property Damage/Operational Function – 9
Total – 23

Earthquake
Life Safety – 10
Property Damage/Operational Function – 10
Total – 20

Extreme Heat
Life Safety – 4
Property Damage/Operational Functio
Total – 7

Hail, Lightning, Tornado
Life Safety – 11
Property Damage/Operational Functio
Total – 25

Flooding
Life Safety – 3
Property Damage/Operational Functio
Total – 7

Terrorism/Mass Violence
Life Safety – 13
Property Damage/Operational Functio
Total – 22

Winter Storm
Life Safety – 10
Property Damage/Operational Functio
Total – 20

Hazards in Order of Priority

note – *Any hazard with an equal score to another will be given the higher priority based on the highest **Life Safety** rating*.

1. **Hail, Lightning, Tornado (Highest Priority)**
2. **Disease Outbreak**
3. **Terrorism/Directed Mass Violence**
4. **Earthquake***
5. **Winter Storm***
6. **Civil Disorder**
7. **Hazardous Materials Incident**
8. **Structure Fire**
9. **Energy Disruption**
10. **Extreme Heat**
11. **Flooding (Lowest Priority)**

*Earthquake and winter storm scored equally. Between the two, winter storm has the highest potential to occur, but the lowest potential of damage/casualties; earthquake has the lowest potential to occur (of all the hazards), but due to geologic survey and hazard simulation, earthquake has the highest potential for damage/casualties on campus.

APPENDIX A: SOURCES

For Official Use Only (FOUO) designation – DoDM 5200.01-V4, February 24, 2012
https://www.fas.org/sgp/othergov/dod/5200_01v1.pdf

Emergency Planning and Community Right-to-Know Act (EPCRA) – Section 304
http://www2.epa.gov/epcra/epcra-section-304

NFPA 704: Standard System for the Identification of the Hazards of Materials for Emergency Response
http://www.nfpa.org/codes-and-standards/document-information-pages?mode=code&code=704

Denver Fire Department 2012 Annual Report
http://www.denvergov.org/LinkClick.aspx?fileticket=WOpnt_jch6o%3d&tabid=436021&mid=488675

FEMA National Incident Management System (NIMS) Guidance – Dec 2008
http://www.fema.gov/pdf/emergency/nims/NIMS_core.pdf

Denver Center for Public Health Preparedness – Denver County cases of selected reportable diseases 2012
http://www.dcphp.org/Portals/2/docs/DenverCounty3rd%20QTR%20YTD%202012.pdf

Rocky Mountain Insurance Information Association – National Hail Statistics
http://www.rmiia.org/catastrophes_and_statistics/Hail.asp

Denver Office of Emergency Management – Lightning Information Sheet
http://www.google.com/url?sa=t&rct=j&q=&esrc=s&frm=1&source=web&cd=1&ved=0CCYQFjAA&url=http%3A%2F%2Fwww.denvergov.org%2FPortals%2F428%2Fdocuments%2FLightning.docx&ei=mCP1UsiUJ8HXygHl-oHYCA&usg=AFQjCNHDfbv7x1uBPC_sZUq29AIcMKo8Hw&bvm=bv.60799247,d.aWc

Tornado Project Online – Colorado Tornadoes 1950-2011 – Denver County Tornadoes
http://www.tornadoproject.com/alltorns/cotorn.htm

State of Colorado – Colorado Natural Hazards Mitigation Plan – December 2013
http://www.dhsem.state.co.us/sites/default/files/2013%20Colorado%20Natural%20Hazards%20Mitigation%20Plan%20-%20Final.pdf

DHS - Identifying Facilities Covered by the Chemical Security Regulation
https://www.dhs.gov/identifying-facilities-covered-chemical-security-regulation

Environmental Protection Agency – EPCRA Sections 311-312
http://www2.epa.gov/epcra/epcra-sections-311-312

U.S. Fire Administration – Nonresidential Building Fire Causes (2007-2011)
http://www.usfa.fema.gov/downloads/pdf/statistics/nonres_bldg_fire_causes.pdf

FEMA – The National Flood Insurance Program (NFIP) – Flood Zones
http://www.fema.gov/floodplain-management/flood-zones

APPENDIX B: ACRONYMS

Acronym	Meaning
AHEC	Auraria Higher Education Center
APD	Auraria Police Department
BNSF	Burlington Northern Santa Fe Railway
CCD	Community College of Denver
CFATS	Chemical Facilities Anti-Terrorism Standards
CU	University of Colorado
DHS	Department of Homeland Security
DIA	Denver International Airport
DOD	Department of Defense
DOT	Department of Transportation
EMS	Emergency Medical Services
EPA	Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act
FACAB	Faculty Advisory Committee to the Auraria Board
FEMA	Federal Emergency Management Agency
FOIA	Freedom of Information Act
FOUO	For Official Use Only
FTE	Full-Time Equivalent
HazMat	Hazardous Materials
HVAC	Heating Ventilation Air Conditioning System
LEPC	Local Emergency Planning Committee
MCI	Mass Casualty Incident
MSU	Metropolitan State University
NFIP	National Flood Insurance Program
NFPA	National Fire Protection Agency
NIMS	National Incident Management System
NRC	National Reporting Center
NWS	National Weather Service
PD	Property Damage
RMIIA	Rocky Mountain Insurance Information Association
RTD	Regional Transportation District
SACAB	Student Advisory Committee to the Auraria Board
SFHA	Special Flood Hazard Area
SQT	Screening Threshold Quantity
THIRA	Threat Hazard Identification and Risk Assessment
TPQ	Threshold Planning Quantities