

**COOK COUNTY  
MULTI-JURISDICTIONAL  
HAZARD MITIGATION PLAN  
VOLUME 2 - Municipal Annexes**

**Palos Hills Annex**

**FINAL**

July 2019

Prepared for:



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## Table of Contents

Hazard Mitigation Point of Contact .....	2
Jurisdiction Profile.....	3
Capability Assessment .....	5
Jurisdiction-Specific Natural Hazard Event .....	10
Hazard Risk Ranking.....	13
Mitigation Strategies and Actions.....	14
New Mitigation Actions .....	18
Ongoing Mitigation Actions .....	21
Completed Mitigation Actions .....	25
Future Needs to Better Understand Risk/Vulnerability .....	29
Additional Comments.....	30
HAZUS-MH Risk Assessment Results .....	31
Hazard Mapping.....	34

## Hazard Mitigation Point of Contact

Primary Point of Contact	Alternate Point of Contact
Gerald R. Bennett, Mayor City of Palos Hills 10335 Roberts Road Palos Hills, IL 60465 Telephone: 708-598-3400 Email Address: <a href="mailto:mayorbennett@paloshillsweb.org">mayorbennett@paloshillsweb.org</a>	Nick Oeffling, Commissioner of Public Works City of Palos Hills 10335 Roberts Road Palos Hills, IL 60465 Telephone: 708-598-3400 Email Address: <a href="mailto:noeffling@paloshillsweb.org">noeffling@paloshillsweb.org</a>

## Jurisdiction Profile

The following is a summary of key information about the jurisdiction and its history:

- **Date of Incorporation:** 1958
- **Current Population:** 17,484
- **Population Growth:** Based on the 2000 census compared to the 2010 census the overall population of the City of Palos Hills has decreased by 2%.
- **Location and Description:** Palos Hills is a city in Cook County, Illinois, United States. It is a southwest suburb of Chicago located 24 miles southwest of the Chicago Loop. The population was 17,484 at the 2010 census. It is the home of Moraine Valley Community College as well as Amos Alonzo Stagg High School. Adjacent suburbs that border Palos Hills include: Hickory Hills to the north, Palos Park and Palos Heights to the south, and Chicago Ridge to the east. Forest Preserves completely surround the western boundaries of Palos Hills. According to the 2010 census, the city has a total area of 4.29 square miles.
- **Brief History:** The earliest inhabitants to the Palos Hills area were Indians during the Upper Mississippian and early historic periods. Archeological excavations reveal two Indian settlements: the Knoll Spring site near the Palos Hills Police Station and another near 107th Street and Route 45. Indians remained in the area until the 1832 Black Hawk War. The building of the Illinois & Michigan Canal from 1836 to 1848 brought Irish and German immigrants to the area. Farmers tilled the land and decimated the timber supply, sending much of it to Chicago via the canal. The first Roman Catholic community, Sacred Heart Roman Catholic Church, was formed in 1872. Agriculture remained the principal occupation of the area until the 1940s. During World War II, the construction of the Dodge-Chrysler aircraft plant at 75th and Cicero attracted workers to the North Palos area, where they lived in substandard housing. Subsequent development of the factory site generated a demand for more housing, but also fostered disagreement on future growth. Impetus for incorporation originated from annexation threats. Hickory Hills' annexation of streets in North Palos in order to establish a speed trap led to the formation of the North Palos Community Council in 1957. The council fought street annexations, but ultimately was forced to choose between incorporation or continued annexation threats. In 1958 North Palos voted to incorporate as the city of Palos Hills. Before 1963 city lots in Palos Hills were large, apartments were banned, and minimal services were provided. Thereafter planned growth allowed unit subdivisions, leading to a building boom. By 1990 the community was largely middle-class, with strong public elementary and high schools, and Moraine Valley Community College. Descendants of Irish, German, and Polish immigrants constitute 50 percent of the population, with substantial numbers of Italian and Greek descendants. Transportation needs are met by easy accessibility to the Stevenson Expressway and the Route 294 Tollway, as well as by Metra train service in the adjacent suburb of Worth and Palos Heights. The western border of Palos Hills consists of 7,000 acres of the Cook County Forest Preserve.
- **Climate:** Palos Hills, IL, gets 39 inches of rain per year and 27 inches of snowfall. The number of days with any measurable precipitation is 120. On average, there are 189 sunny days per year in Palos Hills, IL. The July high is around 85 degrees and the January low is 17. Our comfort index,

which is based on humidity during the hot months, is a 46 out of 100, where higher is more comfortable. The US average on the comfort index is 44.

- **Governing Body Format:** The mayor is the chief executive while the city council, consisting of ten aldermen elected from five wards, is the legislative body. The Mayor is Gerald R. Bennett. The Clerk is Rudy Mulderink. The Treasurer is Kenneth Nolan. This body of Government will assume the responsibility for the adoption and implementation of this plan. Palos Hills operates 6 departments: GIS Department, Economic Development, Police Department, Public Works Department, Parks and Recreation Department, and Community Resources.
- **Development Trends:** The City of Palos Hills is land locked. Most of our building/development took place in the late 70s through the early 90s. Future development in Palos Hills will consist primarily of residential infill with few opportunities for commercial development. The focus of the City now is to capitalize on what little commercial growth opportunities that is currently available through market demographics and analyses.

## Capability Assessment

The assessment of the jurisdiction’s legal and regulatory capabilities is presented in the *Legal and Regulatory Capability Table* below. The assessment of the jurisdiction’s fiscal capabilities is presented in the *Fiscal Capability Table* below. The assessment of the jurisdiction’s administrative and technical capabilities is presented in the *Administrative and Technical Capability Table* below. Information on the community’s National Flood Insurance Program (NFIP) compliance is presented in the *National Flood Insurance Program Compliance Table* below. Classifications under various community mitigation programs are presented in the *Community Classifications Table* below.

<b>TABLE: LEGAL AND REGULATORY CAPABILITY</b>					
	<b>Local Authority</b>	<b>State or Federal Prohibitions</b>	<b>Other Jurisdictional Authority</b>	<b>State Mandated</b>	<b>Comments</b>
<b>Codes, Ordinances &amp; Requirements</b>					
Building Code	Yes	No	No	Yes	Chapter 15.04 Ord. 2008-16
Zonings	Yes	No	No	Yes	
Subdivisions	Yes	No	No	No	Chapter 16.04 Ord. 41 1959
Stormwater Management	Yes	No	MWRD	Yes	State regulates industrial activity from Construction sites 1 acre or larger under section 402 CWA. MWRD Public Act 93-1049 2004 Chapter 15.52 Ord. 91-14 1991
Post Disaster Recovery	Yes	No	No	No	Chapter 2.84 Ord. 89-4&6 1989
Real Estate Disclosure	No	No	Yes	Yes	(765 ILCS 77/) Residential Real Property Disclosure Act.
Growth Management	No	No	No	No	
Site Plan Review	Yes	No	No	No	Chapter 17.56

					Ord. 280 1968
Public Health and Safety	No	No	Yes	Yes	Cook County Board of Health
Environmental Protection	Yes	No	County	No	Chapter 15.08 Ord. 2006-15
<b>Planning Documents</b>					
General or Comprehensive Plan	No	No	No	No	Master Zoning Map
<i>Is the plan equipped to provide linkage to this mitigation plan?</i>					No
Floodplain or Basin Plan	Yes	No	No	No	Chapter 17.18 Ord. 280 1968
Stormwater Plan	Yes	No	No	No	Chapter 15.52 Ord. 91-14
Capital Improvement Plan	Yes	No	No	No	Short Term General Capital Improvements based on current and future needs.
<i>What types of capital facilities does the plan address?</i>					Buildings, equipment, pumping station and infrastructure,
<i>How often is the plan revised/updated?</i>					Annually
Habitat Conservation Plan	Yes	No	No	No	Chapter 17-31 Ord. 808 1983 Chapter 15.36 Ord. 2008-9
Economic Development Plan	No	No	Yes	Yes	The Economic Development Commission is charged with reviewing all economic development related programs and incentives including tax incentives offered through the Cook County 6b

					program. Master Zoning Map provide guidance
Shoreline Management Plan	Yes	No	No	No	Chapter 15-36 Ord. 2008-9
<b>Response/Recovery Planning</b>					
Comprehensive Emergency Management Plan	Yes	No	No	No	<b>Police</b> – Response to Extraordinary Emergency Plan <b>Public Work/Water</b> – Emergency Response Plan <b>Fire</b> – Unified Command and Response Plan <b>Emergency Service &amp; Disaster Agency</b> – Unified Emergency and Response Plan
Threat and Hazard Identification and Risk Assessment	No	No	Yes	No	Cook County DHSEM Preparing THIRA
Terrorism Plan	No	No	Yes	Yes	Cook County DHSEM
Post-Disaster Recovery Plan	No	No	No	No	
Continuity of Operations Plan	No	No	Yes	No	Cook County DHSEM
Public Health Plans	No	No	Yes	No	Cook County DPH

<b>TABLE: FISCAL CAPABILITY</b>	
<b>Financial Resources</b>	<b>Accessible or Eligible to Use?</b>
Community Development Block Grants	Yes
Capital Improvements Project Funding	Yes



Authority to Levy Taxes for Specific Purposes	No. Non-home rule. Referendum required
User Fees for Water, Sewer, Gas or Electric Service	Capital Improvement Fee on Water Bill
Incur Debt through General Obligation Bonds	Eligible for 30 million. Referendum required
Incur Debt through Special Tax Bonds	Non-home rule. Referendum required
Incur Debt through Private Activity Bonds	None
Withhold Public Expenditures in Hazard-Prone Areas	Referendum required
State Sponsored Grant Programs	Yes
Development Impact Fees for Homebuyers or Developers	No

**TABLE: ADMINISTRATIVE AND TECHNICAL CAPABILITY**

Staff/Personnel Resources	Available?	Department/Agency/Position
Planners or engineers with knowledge of land development and land management practices	Yes	Building Dept. Engineering Consultan
Engineers or professionals trained in building or infrastructure construction practices	Yes	Building Dept., Water Dept., Engineering Consultant
Planners or engineers with an understanding of natural hazards	Yes	Building Dept., Water Dept., Engineering Consultant
Staff with training in benefit/cost analysis	Yes	Engineering Consultant
Surveyors	Yes	Engineering Consultant
Personnel skilled or trained in GIS applications	Yes	In house GIS Staff , Cook County GIS Consortium
Scientist familiar with natural hazards in local area	No	Would locate if needed through our Engineer Consultant
Emergency manager	Yes	Police Chief, Fire Chief, Emergency Service & Disaster Agency Director and Commissioner of Public Works
Grant writers	No	

<b>TABLE: NATIONAL FLOOD INSURANCE PROGRAM COMPLIANCE</b>	
What department is responsible for floodplain management in your jurisdiction?	Public Work, Building and Engineering Depts.
Who is your jurisdiction’s floodplain administrator? (department/position)	Commissioner of Public Works
Are any certified floodplain managers on staff in your jurisdiction?	No
What is the date of adoption of your flood damage prevention ordinance?	Ord. 280 - 1968
When was the most recent Community Assistance Visit or Community Assistance Contact?	12/11/1996
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? If so, please state what they are.	No
Do your flood hazard maps adequately address the flood risk within your jurisdiction? (If no, please state why)	Yes
Does your floodplain management staff need any assistance or training to support its floodplain management program? If so, what type of assistance/training is needed?	Yes – General overview and update training
Does your jurisdiction participate in the Community Rating System (CRS)? If so, is your jurisdiction seeking to improve its CRS Classification? If not, is your jurisdiction interested in joining the CRS program?	No – we have no interest in joining

<b>TABLE: COMMUNITY CLASSIFICATIONS</b>			
	<b>Participating?</b>	<b>Classification</b>	<b>Date Classified</b>
Community Rating System	No	N/A	N/A
Building Code Effectiveness Grading Schedule	No	N/A	N/A
Public Protection/ISO	Yes	ISO 3	2009
StormReady	Yes	Gold (Countywide)	2014
Tree City USA	Yes	N/A	1989

## Jurisdiction-Specific Natural Hazard Event

The information provided below was solicited from the jurisdiction and supported by NOAA and other relevant data sources.

The *Natural Hazard Events Table* lists all past occurrences of natural hazards within the jurisdiction. Repetitive flood loss records are as follows:

- Number of FEMA-Identified Repetitive Loss Properties: 3
- Number of FEMA-Identified Severe Repetitive Loss Properties: 0
- Number of Repetitive Flood Loss/Severe Repetitive Loss Properties That Have Been Mitigated: 3

<b>TABLE: NATURAL HAZARD EVENTS</b>			
<b>Type of Event</b>	<b>FEMA Disaster# (if applicable)</b>	<b>Date</b>	<b>Preliminary Damage Assessment</b>
Hail	-	6/28/2014	-
Hail	-	5/20/2014	-
Severe Thunderstorm, High Winds, Flooding	-	9/11/2013	\$50,000
Severe Thunderstorm, Wind, Flooding	ID# 9421181	7/24/2012	\$50,000
Lighting, Minor Flooding	-	7/19/2012	\$50,000
Flooding and Lighting	ID# 9323634	6/9/2011	\$55,000
Winter Weather	ID# 9313997	2/1/2011	\$75,000
Severe Snow Storm	DR-1960	1/31/2011	\$50,000
Wind Storm	-	10/28/2010	\$40,000
Severe Thunderstorm, Flooding	ID# 9251406	7/24/2010	\$40,000
Lighting, Strong Storm, Wind	ID# 9251402	7/23/2010	\$50,000
Severe Thunderstorm and Wind	ID# 9248714	6/18/2010	\$40,000

Severe Rain Storm and Flooding	-	3/7/2009 - 3/10/2009	\$40,000
Winter Storm, Winds and Flooding	ID# 8958077	12/27/2008	\$40,000
High Winds	ID# 8941832	10/26/2008	\$40,000
Winter Rain Storm	-	1/7/2008	\$40,000
Severe Thunderstorm, Winds, and Flooding	-	8/30/2007	\$40,000
Severe Thunderstorm, Winds and Flooding	ID# 8811471	10/02/2006	\$4,000,000
Flash Flooding	ID# 8807363	8/10/2006	\$10,000
Severe Thunderstorm, Winds, and Lightning	ID# 8807328	8/2/2006	\$10,000
Thunderstorm, Winds	ID# 8815175	4/16/2006	\$10,000
Thunderstorm	-	7/20/2005	\$20,000
Severe Snow Storm	EM-3134	1/1/1999	\$50,000
Flooding	ID# 54959	7/17/1996	\$2,000,000

### Jurisdiction-Specific Hazards and Impacts

Hazards that represent a county-wide risk are addressed in the Risk Assessment section of the 2019 Cook County Multi-Jurisdictional Hazard Mitigation Plan Update. This section only addresses the hazards and their associated impacts that are **relevant** and **unique** to the municipality.

**Dam/Levee Failure:** In the City, the lagoon in the Hills has a levee to keep Stoney Creek from flooding the subdivision out. But this levee is old, in poor shape, and made with guardrail and dirt.

**Flood:** The overflow needs to be dredged because Roberts Rd. floods. When it floods, 50-year-old pumps at lift stations and the overflow go down side streets from 99th St. to 103 St. Lucas ditch. The City would benefit from adding a detention basin upstream in HH Golf Course, 103rd St. North to 99th St. (from 78th Ave to the Lucas Ditch is a FEMA floodplain). This area has repetitive flooding issues which result in hundreds of residences experiencing flooding and water damage.

**Extreme Heat:** The City doesn't have an elevated water tower which adds redundancy in case we have a power outage that compromises pumps. With an aging population and older homes that may not have air conditioning, extreme heat can be an issue. Cooling centers with AC and friendly policy can positively impact the elderly to seek shelter with pets.

**High Winds:** Since high winds result in tree damage, the City would benefit from more time and staff for pruning programs. Also, the lack of generators at sewage lift stations poses a critical power outage risk. Additionally, building codes with hurricane ties and uplift loads designed into structures could help protect the City.

**Drought:** The City is vulnerable to droughts because of its elevated water tower and lack of water pumps (they are 50 years old and need replacement).

**Snow:** In order to protect the community's residents and property, the City needs funding for new trucks. Current small trucks in the fleet are all 20 years old. In addition, 90th Ave. and 98th St. changes in grade make snow hazardous for transportation. These must be placed first and often to prevent hazardous conditions.

**Blizzards:** In order to protect the community's residents and property, the City needs funding for new trucks. Current small trucks in the fleet are all 20 years old. In addition, 90th Ave. and 98th St. changes in grade make snow hazardous for transportation. These must be placed first and often to prevent hazardous conditions.

**Extreme Cold:** The City needs backup power at water stations and sewer stations to safeguard its residents and facilities against the impacts of extreme cold. Currently, generators in multi-family buildings keep running during extreme events to keep heat and prevent pipe breaks.

**Ice Storms:** Backup power at water stations and sewer stations. Palos Hills is a tree city. The number and size of trees in the City make ice storms more dangerous for limb failures causing power outages, etc. The City would be less vulnerable to ice storms if there was backup power at water and sewer stations.

**Tornado:** The City would be less vulnerable to tornadoes if there was backup power at water and sewer stations.

**Widespread Power Outage:** The City is vulnerable to various severe weather conditions, and as noted the lack of backup power for essential stations puts risks for life and property.

**Hazardous Material Release:** Sewage pumping stations are all over 50 years old and lack backup power generation.

## Hazard Risk Ranking

The *Hazard Risk Ranking Table* below presents the ranking of the hazards of concern. Hazard area extent and location maps are included at the end of this chapter. These maps are based on the best available data at the time of the preparation of this plan, and are considered to be adequate for planning purposes.

<b>TABLE: HAZARD RISK RANKING</b>		
<b>Rank</b>	<b>Hazard Type</b>	<b>Risk Rating Score (Probability x Impact)</b>
1	Severe Weather	54
2	Flooding	42
3	Severe Winter Weather	42
4	Tornado	36
5	Earthquake	32
6	Drought	2
7	Dam Failure	0

## Mitigation Strategies and Actions

The heart of the mitigation plan is the mitigation strategy, which serves as the long-term blueprint for reducing the potential losses identified in the risk assessment. The mitigation strategy describes how the community will accomplish the overall purpose, or mission, of the planning process. In this section, mitigation actions/projects were updated/amended, identified, evaluated, and prioritized. This section is organized as follows:

- New Mitigation Actions - New actions identified during this 2019 update process
- Ongoing Mitigation Actions - Ongoing actions with no definitive end or that are still in progress. During the 2019 update, these "ongoing" mitigation actions and projects were modified and/or amended, as needed.
- Completed Mitigation Actions - An archive of all identified and completed projects, including completed actions since 2014.

The *Hazard Mitigation Action Plan Matrix Table* below lists the actions that make up the jurisdiction’s hazard mitigation plan. The *Mitigation Strategy Priority Schedule Table* identifies the priority for each action.

TABLE: HAZARD MITIGATION ACTION PLAN MATRIX						
Status	Hazards Mitigated	Objectives Met	Lead Agencies	Estimated Cost	Sources of Funding	Timeline/Projected Completion Date (a)
<b>Action P3.1</b> —Conduct a building code education/land use and severe weather awareness program. With the goal to educate residents about building codes that preserve drainage pattern on private property and education on how to plan and respond to severe weather events.						
Completed	All Hazards	1, 5, 6, 13	City of Palos Hills	Low	Grants and General Fund	Completed
<b>Action P3.2</b> —Improve stormwater drainage capacity through re-routing of the stormwater drainage systems in the flood zone under and east of Roberts Road.						
Ongoing	Flooding	2, 8, 9, 12	County	High	MWRD, County, Grants	Long-term
<b>Action P3.3</b> —Severe weather/warning system. Early warning system to call landline and cell phones to notify residents of approaching severe weather impacts for all severe weather and other urgent community notifications, i.e., water main breaks, water shortage due power outage, road closures, extreme cold, frozen pipes etc.						

Completed	All	1, 5, 6, 8	City of Palos Hills	Medium	Grants and General Fund	Completed
<b>Action P3.4</b> —Increase salt storage. During severe winter weather conditions. Salt becomes scarce due to frozen shipping routes. Additional storage would negate the need for salt usage restrictions and eliminate the use of sand and slag that choke storm sewer drainage systems and waterways.						
Ongoing	Severe Winter Weather	1, 2, 9, 13	City of Palos Hills	High	Grants and General Fund	Long-term
<b>Action P3.5</b> —Where appropriate, support retrofitting, purchase, or relocation of structures in hazard-prone areas to prevent future structure damage. Give priority to properties with exposure to repetitive losses.						
Ongoing	All	7, 13	City of Palos Hills	High	FEMA Hazard Mitigation Grants	Long-term (depending on funding)
<b>Action P3.6</b> —Continue to support the countywide actions identified in this plan.						
Ongoing	All	All	City of Palos Hills	Low	General Fund	Short- and long-term
<b>Action P3.7</b> —Actively participate in the plan maintenance strategy identified in this plan.						
Ongoing	All	3, 4, 6	DHSEM, City of Palos Hills	Low	General Fund	Short-term
<b>Action P3.8</b> —Consider or maintain participation in incentive-based programs such as Tree City and StormReady.						
Completed	All	3, 4, 5, 6, 7, 9, 10, 11, 13	City of Palos Hills	Low	General Fund	Completed
<b>Action P3.9</b> —Maintain good standing under the National Flood Insurance Program by implementing programs that meet or exceed the minimum NFIP requirements. Such programs include enforcing an adopted flood damage prevention ordinance, participating in floodplain mapping updates, and providing public assistance and information on floodplain requirements and impacts.						
Completed	Flooding	4, 6, 9	City of Palos Hills	Low	General Fund	Completed
<b>Action P3.10</b> —Where feasible, implement a program to record high water marks following high-water events.						
Completed	Flooding, Severe Weather	3, 6, 9	City of Palos Hills	Medium	General Fund; FEMA	Completed



					Grant Funds (Public Assistance)	
<b>Action P3.11</b> —Integrate the hazard mitigation plan into other plans, programs, or resources that dictate land use or redevelopment.						
Completed	All	3, 4, 6, 10, 13	Palos Hills Building Department	Low	General Fund	Completed
<b>Action P3.12</b> —No water tower, water and sewage pumping stations are all over 50 years old. Add backup power generation and upgrade station.						
New	Drought, Flood, Extreme Heat, Lightning, High Wind, Extreme Cold, Ice Storms, Tornado, Epidemic or Pandemic, Widespread Power Outage	2, 12	Palos Hills	\$3,000,000; High	Public Works	2030
(a) Ongoing indicates continuation of an action that is already in place. Short-term indicates implementation within five years. Long-term indicates implementation after five years.						

TABLE: MITIGATION STRATEGY PRIORITY SCHEDULE							
Action Number	# of Objectives Met	Benefits	Costs	Do Benefits Equal or Exceed Costs?	Is Project Grant-Eligible?	Can Project Be Funded Under Existing Programs/Budgets?	Priority (a)
1	4	High	Low	Yes	Yes	No	Medium
2	5	High	High	Yes	Yes	No	Medium
3	4	High	Medium	Yes	Yes	No	Medium
4	4	High	High	Yes	Yes	No	Medium

5	2	High	High	Yes	Yes	No	Medium
6	13	Medium	Low	Yes	No	Yes	High
7	3	Medium	Low	Yes	Yes	Yes	High
8	9	Medium	Low	Yes	No	Yes	Medium
9	3	Medium	Low	Yes	No	Yes	High
10	3	Medium	Medium	Yes	Yes	No	Medium
11	5	Medium	Low	Yes	No	Yes	High
12	2	High	High	Yes	Unknown	Yes	High

(a) See Chapter 1 for explanation of priorities.

## New Mitigation Actions

The following are new mitigation actions created during the 2019 update.

**Action P3.12**

<b>Mitigation Action</b>	No water tower, water and sewage pumping stations are all over 50 years old. Add backup power generation and upgrade station.
<b>Year Initiated</b>	2019
<b>Applicable Jurisdiction</b>	Palos Hills
<b>Lead Agency/Organization</b>	Palos Hills
<b>Supporting Agencies/Organizations</b>	Public Works
<b>Applicable Goal</b>	<ul style="list-style-type: none"> <li>• Develop and implement sustainable, cost-effective, and environmentally sound risk-reduction (mitigation) projects.</li> <li>• Protect the lives, health, safety, and property of the citizens of Cook County from the impacts of natural hazards.</li> <li>• Protect public services and critical facilities, including infrastructure, from loss of use during natural hazard events.</li> <li>• Involve stakeholders to enhance the local capacity to mitigate, prepare for, and respond to the impacts of natural hazards.</li> </ul>
<b>Applicable Objective</b>	<ul style="list-style-type: none"> <li>• Increase the resilience of (or protect and maintain) infrastructure and critical facilities.</li> <li>• Reduce natural hazard-related risks and vulnerability to potentially isolated populations within the planning area.</li> </ul>
<b>Potential Funding Source</b>	Public Works
<b>Estimated Cost</b>	\$3,000,000
<b>Benefits (loss avoided)</b>	Water supplied citywide and sewage pumped.
<b>Projected Completion Date</b>	2030
<b>Priority and Level of Importance (Low, Medium, High)</b>	High Priority
<b>Benefit Analysis (Low, Medium, High)</b>	High - Project will provide an immediate reduction of risk exposure for life and property.
<b>Cost Analysis (Low, Medium, High)</b>	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).
<b>Actual Completion Date</b>	TBD

**Recommended Mitigation Action/Implementation Plan and Project Description**

Action/Implementation Plan and Project Description:

Mitigation Action and Project Maintenance		
Year	Status	Comments
2019	New	
2020		
2021		
2022		
2023		

Mitigated Hazards	
	<b>All Hazards</b>
	Dam/Levee Failure
X	Drought
	Earthquake
X	Flood
X	Extreme Heat
X	Lightning
	Hail
	Fog
X	High Wind
	Snow
	Blizzard
X	Extreme Cold
X	Ice Storms
X	Tornado
X	Epidemic or pandemic
	Nuclear Power Plant Incident
X	Widespread Power Outage
	Coastal Erosion
	Secondary Impacts from Mass Influx of Evacuees
X	Hazardous Materials Release

### Ongoing Mitigation Actions

The following are ongoing actions with no definitive end or that are still in progress. During the 2019 update, these "ongoing" mitigation actions and projects were modified and/or amended, as needed.

**Action P3.2**

<b>TABLE: ACTION PLAN MATRIX</b>		
Action Number Action Taken Y/N	Action Item Description	Status (X, O, C, R, N)
# 2—P3.2	Improve stormwater drainage capacity through re-routing of the stormwater drainage systems in the flood zone under and east of Roberts Road.	
Status Description: Yes	The Roberts Rd drainage project has been accepted into MWRD's Phase II Stormwater Management Program. They have agreed to provide engineering assistance for the project.	O
Completion status legend: <b>N</b> = New <b>O</b> = Action Ongoing toward Completion <b>C</b> = Project Completed <b>R</b> = Want Removed from Annex <b>X</b> = No Action Taken		

**Action P3.4**

<b>TABLE: ACTION PLAN MATRIX</b>		
Action Number Action Taken Y/N	Action Item Description	Status (X, O, C, R, N)
# 4—P3.4	Increase salt storage. During severe winter weather conditions. Salt becomes scarce due to frozen shipping routes. Additional storage would negate the need for salt usage restrictions and eliminate the use of sand and slag that choke storm sewer drainage systems and water ways.	
Status Description: Yes	The project will be completed when the city builds a new public work facility. The project has a completion date of January 2020.	O
Completion status legend: <b>N</b> = New <b>O</b> = Action Ongoing toward Completion <b>C</b> = Project Completed <b>R</b> = Want Removed from Annex <b>X</b> = No Action Taken		

**Action P3.5**

<b>TABLE: ACTION PLAN MATRIX</b>		
Action Number Action Taken Y/N	Action Item Description	Status (X, O, C, R, N)
# 5—P3.5	Where appropriate, support retrofitting, purchase, or relocation of structures in hazard-prone areas to prevent future structure damage. Give priority to properties with exposure to repetitive losses.	
Status Description: No	No action has been taken. Fund is limited.	X
Completion status legend: <b>N</b> = New <b>O</b> = Action Ongoing toward Completion <b>C</b> = Project Completed <b>R</b> = Want Removed from Annex <b>X</b> = No Action Taken		

**Action P3.6**

<b>TABLE: ACTION PLAN MATRIX</b>		
Action Number Action Taken Y/N	Action Item Description	Status (X, O, C, R, N)
# 6—P3.6	Continue to support the countywide actions identified in this plan.	
Status Description: Yes	The city is in support of the actions within this plan and will continue to support the plan	O
Completion status legend: <b>N</b> = New <b>O</b> = Action Ongoing toward Completion <b>C</b> = Project Completed <b>R</b> = Want Removed from Annex <b>X</b> = No Action Taken		



**Action P3.7**

<b>TABLE: ACTION PLAN MATRIX</b>		
Action Number Action Taken Y/N	Action Item Description	Status (X, O, C, R, N)
# 7—P3.7	Actively participate in the plan maintenance strategy identified in this plan.	
Status Description: Yes	The city continues efforts to reduce and mitigate the effects of severe weather events through available means. At this time funding allows us to maintain creeks, streams, ditches and storm sewer to prevent flooding. We also have begun rebuilding our sanitary lift stations, which are all over 50 years old.	O
Completion status legend: <b>N</b> = New <b>O</b> = Action Ongoing toward Completion <b>C</b> = Project Completed <b>R</b> = Want Removed from Annex <b>X</b> = No Action Taken		

### Completed Mitigation Actions

The following section represents completed mitigation actions, and serves as an archive of identified and completed projects.

**Action P3.1**

<b>TABLE: ACTION PLAN MATRIX</b>		
Action Number Action Taken Y/N	Action Item Description	Status (X, O, C, R, N)
# 1—P3.1	Conduct a building code education/land use and severe weather awareness program. With the goal to educate residents about building codes that preserve drainage pattern on private property and education on how to plan and respond to severe weather events	
Status Description: Yes	Our building department has adopted 2015 IBC.	C
<p style="text-align: center;">Completion status legend:  <b>N</b> = New    <b>O</b> = Action Ongoing toward Completion  <b>C</b> = Project Completed    <b>R</b> = Want Removed from Annex    <b>X</b> = No Action Taken</p>		

**Action P3.3**

<b>TABLE: ACTION PLAN MATRIX</b>		
Action Number Action Taken Y/N	Action Item Description	Status (X, O, C, R, N)
# 3—P3.3	Severe weather / warning system. Early warning system to call land line and cell phones to notify residents of approaching severe weather impacts for all severe weather and other urgent community notifications, i.e., water main breaks, water shortage due power outage, road closures, extreme cold, frozen pipes etc.	
Status Description: No	The city has entered into a contract with One Call to provide an early warning for weather and other urgent community notifications.	C
<p style="text-align: center;">Completion status legend:  <b>N</b> = New    <b>O</b> = Action Ongoing toward Completion  <b>C</b> = Project Completed    <b>R</b> = Want Removed from Annex    <b>X</b> = No Action Taken</p>		

**Action P3.8**

<b>TABLE: ACTION PLAN MATRIX</b>		
Action Number Action Taken Y/N	Action Item Description	Status (X, O, C, R, N)
# 8—P3.8	Consider or maintain participation in incentive-based programs such as Tree City and StormReady.	
Status Description: Yes	The city currently is a Tree City USA community. We are looking into becoming a Storm Ready Community.	C
Completion status legend: <b>N</b> = New <b>O</b> = Action Ongoing toward Completion <b>C</b> = Project Completed <b>R</b> = Want Removed from Annex <b>X</b> = No Action Taken		

**Action P3.9**

<b>TABLE: ACTION PLAN MATRIX</b>		
Action Number Action Taken Y/N	Action Item Description	Status (X, O, C, R, N)
# 9—P3.9	Maintain good standing under the National Flood Insurance Program by implementing programs that meet or exceed the minimum NFIP requirements. Such programs include enforcing an adopted flood damage prevention ordinance, participating in floodplain mapping updates, and providing public assistance and information on floodplain requirements and impacts.	
Status Description: Yes	The city is in compliance with the NFIP requirements.	C
Completion status legend: <b>N</b> = New <b>O</b> = Action Ongoing toward Completion <b>C</b> = Project Completed <b>R</b> = Want Removed from Annex <b>X</b> = No Action Taken		

**Action P3.10**

<b>TABLE: ACTION PLAN MATRIX</b>		
Action Number Action Taken Y/N	Action Item Description	Status (X, O, C, R, N)
# 10—P3.10	Where feasible, implement a program to record high water marks following high-water events.	
Status Description: Yes	The city has recorded high water levels with photos of the events.	C
Completion status legend: <b>N</b> = New <b>O</b> = Action Ongoing toward Completion <b>C</b> = Project Completed <b>R</b> = Want Removed from Annex <b>X</b> = No Action Taken		

**Action P3.11**

<b>TABLE: ACTION PLAN MATRIX</b>		
Action Number Action Taken Y/N	Action Item Description	Status (X, O, C, R, N)
# 11—P3.11	Integrate the hazard mitigation plan into other plans, programs, or resources that dictate land use or redevelopment.	
Status Description: Yes	The city has adopted 2015 IBC.	C
Completion status legend: <b>N</b> = New <b>O</b> = Action Ongoing toward Completion <b>C</b> = Project Completed <b>R</b> = Want Removed from Annex <b>X</b> = No Action Taken		

## Future Needs to Better Understand Risk/Vulnerability

No needs have been identified at this time.

## Additional Comments

No additional comments at this time

### HAZUS-MH Risk Assessment Results

PALOS HILLS EXISTING CONDITIONS	
2010 Population	17,484
Total Assessed Value of Structures and Contents	\$2,708,254,573
Area in 100-Year Floodplain	189.81 acres
Area in 500-Year Floodplain	359.60 acres
Number of Critical Facilities	44

HAZARD EXPOSURE IN PALOS HILLS						
	Number Exposed		Value Exposed to Hazard		Total	% of Total Assessed Value Exposed
	Population	Buildings	Structure	Contents		
<b>Dam Failure</b>						
Buffalo Creek	0	0	\$0	\$0	\$0	0.00%
U. Salt Cr. #2	0	0	\$0	\$0	\$0	0.00%
Touhy	0	0	\$0	\$0	\$0	0.00%
U. Salt Cr. #3	0	0	\$0	\$0	\$0	0.00%
U. Salt Cr. #4	0	0	\$0	\$0	\$0	0.00%
<b>Flood</b>						
100-Year	215	66	\$52,344,050	\$45,777,610	\$98,121,660	3.62%



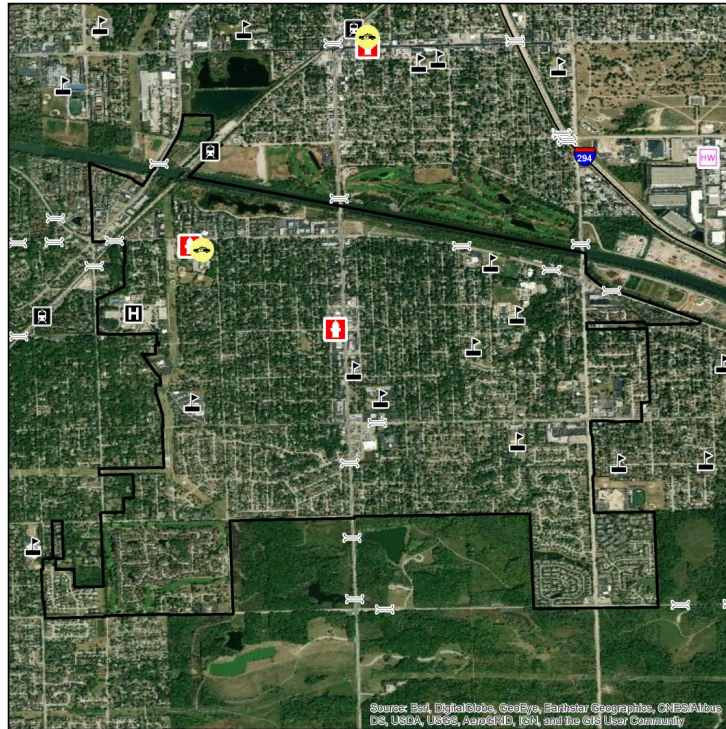
500-Year	1,755	540	\$188,852,811	\$123,853,191	<b>\$312,706,002</b>	11.55%
<b>Tornado</b>						
100-Year	—	—	\$237,759,340	\$132,838,166	<b>\$370,597,506</b>	13.68%
500-Year	—	—	\$544,183,986	\$396,322,977	<b>\$940,506,964</b>	34.73%

**ESTIMATED PROPERTY DAMAGE VALUES IN PALOS HILLS**

	Estimated Damage Associated with Hazard			% of Total Assessed Value Damaged
	Building	Contents	Total	
<b>Dam Failure</b>				
Buffalo Creek	\$0	\$0	<b>\$0</b>	0.00%
U. Salt Cr. #2	\$0	\$0	<b>\$0</b>	0.00%
Touhy	\$0	\$0	<b>\$0</b>	0.00%
U. Salt Cr. #3	\$0	\$0	<b>\$0</b>	0.00%
U. Salt Cr. #4	\$0	\$0	<b>\$0</b>	0.00%
<b>Earthquake</b>				
1909 Historical Event	\$46,765,670	\$15,078,270	<b>\$61,843,940</b>	2.28%
<b>Flood</b>				
10-Year	\$227,649	\$266,456	<b>\$494,105</b>	0.02%
100-Year	\$2,626,053	\$5,816,627	<b>\$8,442,680</b>	0.31%
500-Year	\$14,061,310	\$15,023,221	<b>\$29,084,531</b>	1.07%

<b>Tornado</b>				
100-Year	\$23,775,934	\$13,283,817	<b>\$37,059,751</b>	1.37%
500-Year	\$79,450,862	\$57,863,155	<b>\$137,314,017</b>	5.07%

# Hazard Mapping



## VILLAGE OF PALOS HILLS

### CRITICAL INFRASTRUCTURE

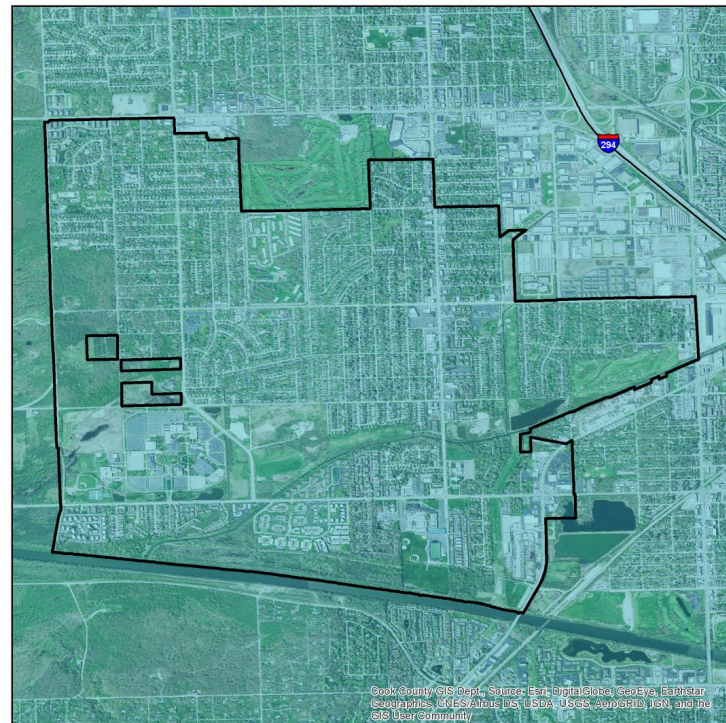
- Oil Facilities
- Transit Centers
- Military Facilities
- Police Stations
- Fire Stations
- Hazardous Waste
- Airports
- Hospitals
- Highway Bridges
- Warming Centers
- Cooling Centers
- Schools
- Railroad Stations

Base Map Data Sources:  
Cook County, ESRI



0 0.125 0.25 0.5 0.75 1 Miles

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



## CITY OF PALOS HILLS

### PEAK GROUND ACCELERATION FOR A 100 YEAR EARTHQUAKE EVENT

**Mercalli Scale, Potential Shaking**  
II-III Weak

Data provided by the USGS Earthquake Hazards Program and Cook County.

Probabilistic seismic hazard maps were prepared for the conterminous United States for 2014 portraying peak horizontal acceleration and horizontal spectral response acceleration for 0.2- and 1.0-second periods with probabilities of exceedance of 10 percent in 50 years and 2 percent in 50 years. All of the maps were prepared by combining the hazard derived from spatially smoothed historical seismicity with the hazard from fault-specific sources. The acceleration values contoured are the random horizontal component. The reference site condition is firm rock, defined as having an average shear-wave velocity of 760 m/s in the top 30 meters corresponding to the boundary between NEHRP (National Earthquake Hazards Reduction Program) site classes B and C.

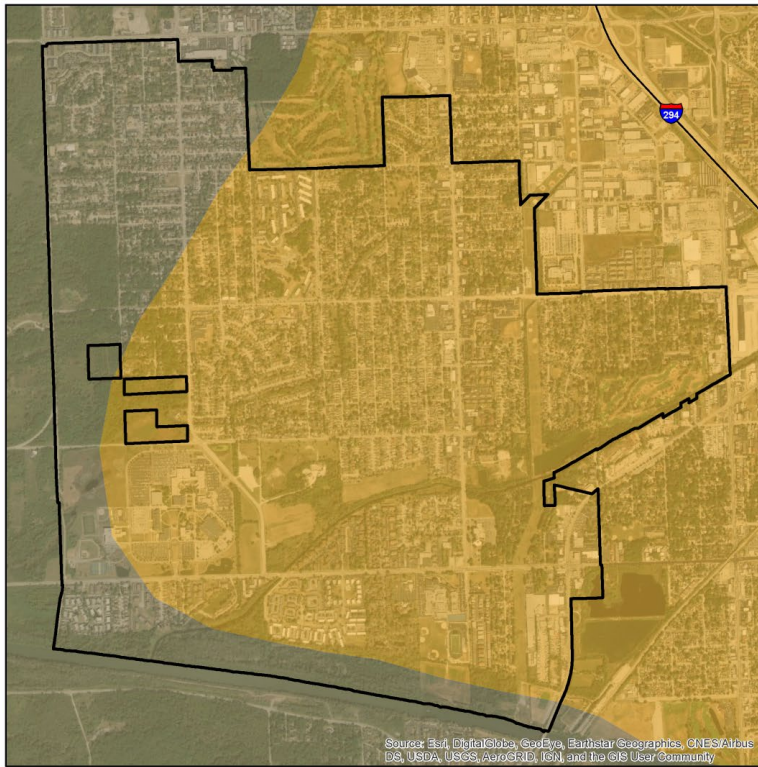
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0 0.125 0.25 0.5 0.75 1 Miles

Cook County GIS Dept., Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community





**CITY OF  
PALOS HILLS**

**NATIONAL EARTHQUAKE HAZARD  
REDUCTION PROGRAM (NEHRP)  
SOIL CLASSIFICATION**

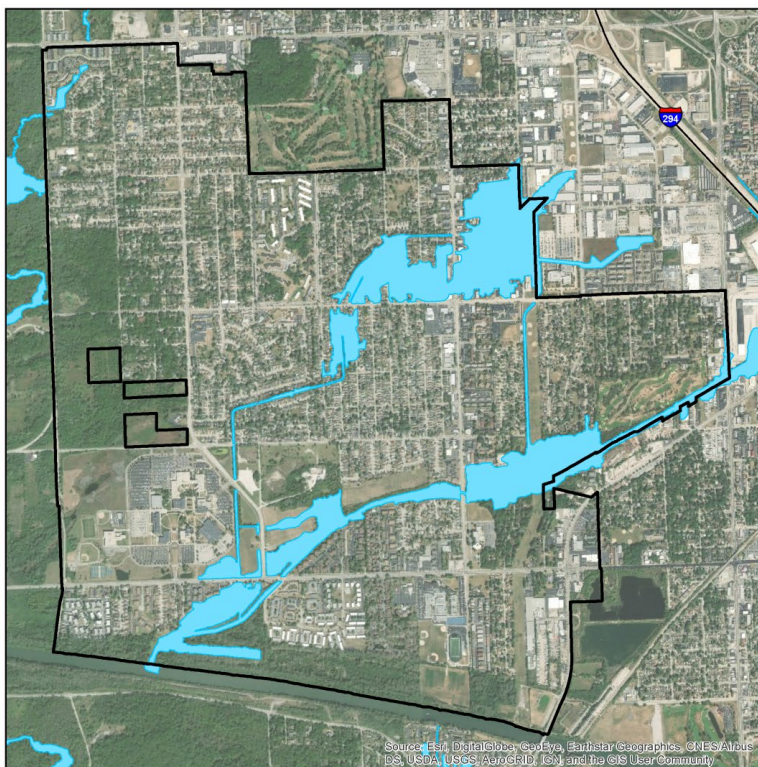
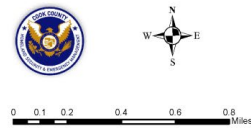
**TYPE**

- C - Very Dense Soil, Soft Rock
- D - Stiff Soil
- F - Site Specific Evaluation

Data provided by the Illinois State Geological Survey and Cook County.

The Central United States Earthquake Consortium (CUSEC) State Geologists produced a regional Soil Site Class map (NEHRP Soil Profile Type Map), a Liquefaction Susceptibility Map and a Soil Response Map for the 8 states to be used in the FEMA New Madrid Catastrophic Planning Initiative Phase I work. The USGS Geologic Investigation Series I-2789 Map of Surficial Deposits and Materials in the Eastern and Central United States (East of 102 degrees West, Longitude) by David S. Fullerton, Charles A. Bush and Jean N. Pennell (2003) was the base map used for this work. Each State Geological Survey produced its own state map version of the Soil Site Class and Liquefaction Susceptibility maps. The procedures outlined in the NEHRP provisions (Building Seismic Safety Council, 2004) and the 2003 International Building Codes (International Code Council, 2002) were followed to produce the soil site class maps. CUSEC State Geologists used the entire column of soils material down to bedrock and did not include any bedrock in the calculation of the average shear wave velocity for the column, since it is the soil column and the difference in shear wave velocity of the soils in comparison to the bedrock which influences much of the amplification.

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**CITY OF  
PALOS HILLS**

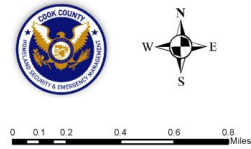
**COOK COUNTY MWRDGC  
100-YEAR INUNDATION AREA**

■ 100-year Inundation Area

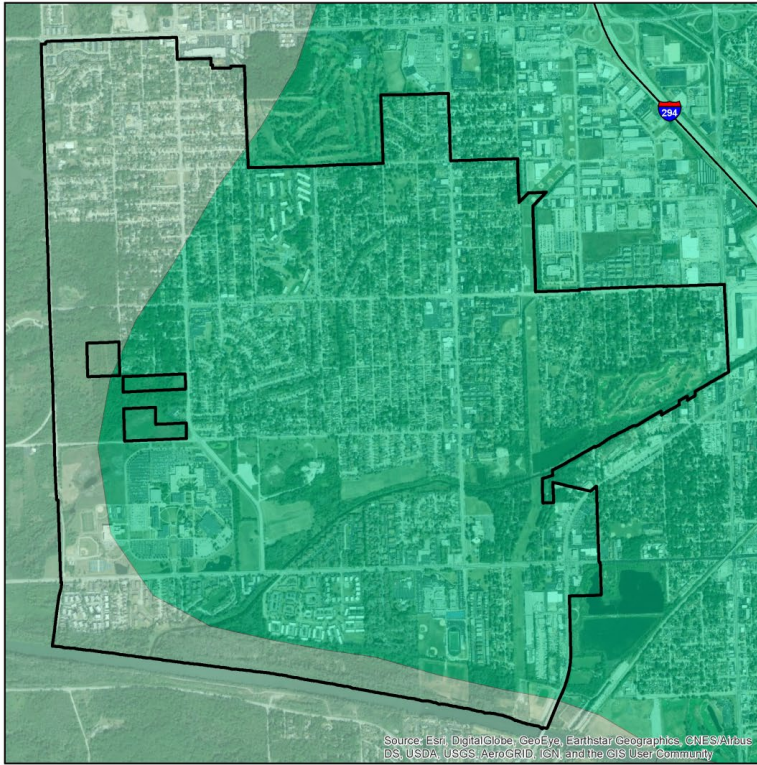
MWRDGC Data provided by Metropolitan Water Reclamation District of Greater Chicago and Cook County.

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**DISCLAIMER:** The Cook County MWRDGC 100-year Inundation Map is provided to show general flood risk information regarding floodplains and inundation areas. This map is not regulatory. Official FEMA Flood Insurance Study information and regulatory maps can be obtained from <http://www.fema.gov>.

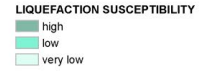






**CITY OF  
PALOS HILLS**

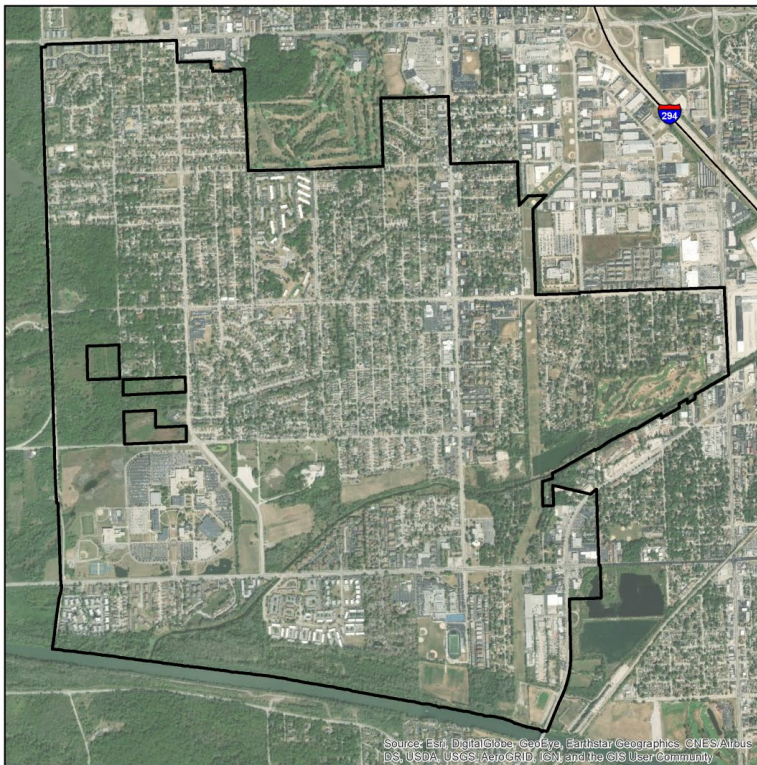
**LIQUEFACTION SUSCEPTIBILITY**



Data provided by the Illinois State Geological Survey and Cook County

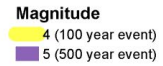
The Central United States Earthquake Consortium (CUSEC) State Geologists produced a regional Soil Site Class map (NEHRP Soil Profile Type Map), a Liquefaction Susceptibility Map and a Soil Response Map for the 8 states to be used in the FEMA New Madrid Catastrophic Planning Initiative Phase I work. The USGS Geologic Investigation Series I-2789 Map of Surficial Deposits and Materials in the Eastern and Central United States (East of 102 degrees West Longitude) by David S. Fullerton, Charles A. Bush and Jean N. Pennell (2003) was the base map used for this work. Each State Geological Survey produced its own state map version of the Soil Site Class and Liquefaction Susceptibility maps. The procedures outlined in the NEHRP provisions (Building Seismic Safety Council, 2004) and the 2000 International Building Codes (International Code Council, 2002) were followed to produce the soil site class maps. CUSEC State Geologists used the entire column of soils material down to bedrock and did not include any bedrock in the calculation of the average shear wave velocity for the column, since it is the soil column and the difference in shear wave velocity of the soils in comparison to the bedrock which influences much of the amplification.

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**CITY OF  
PALOS HILLS**

**100- AND 500-YEAR  
TORNADO EVENTS**



Historic tornado data provided by NOAA/NWS showing the initial points and paths of all F4 and F5 events observed from 1950 to 2017.

