

# Using the Emergency Response Guide Widget

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# Agenda

- Emergency Response Guidebook
  - History
  - Components
- Emergency Response Guide Widget
  - Development
  - Updates
- Demonstration
- Upcoming
- Questions

# Emergency Response Guidebook

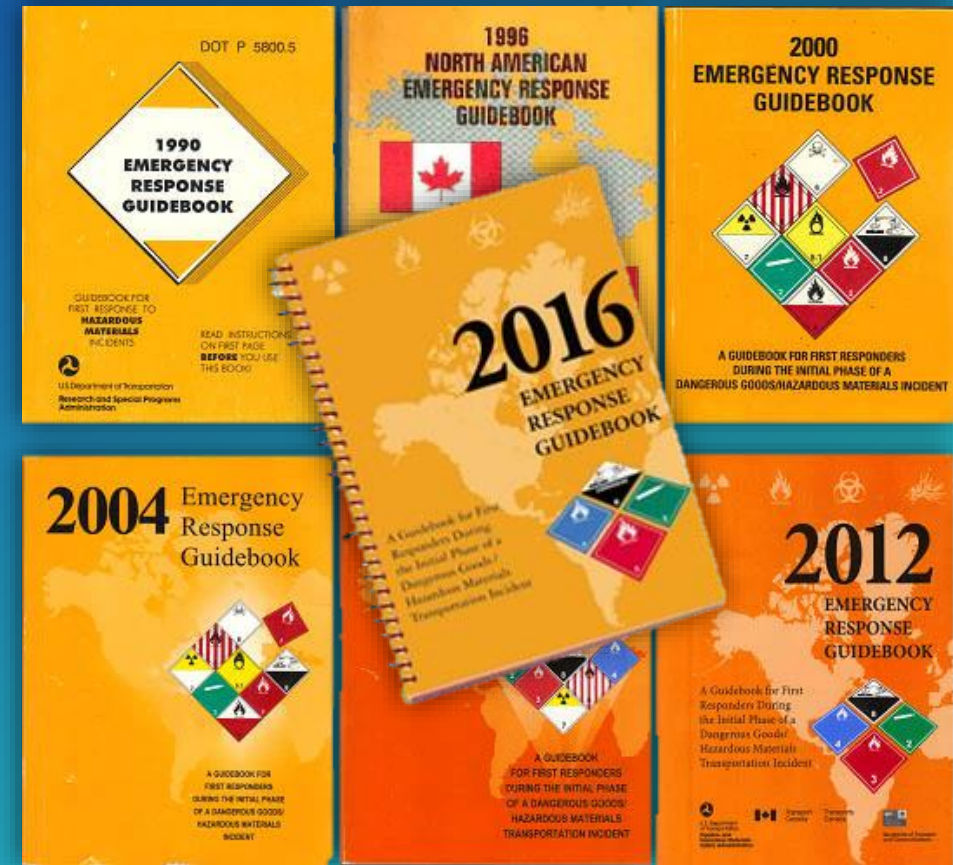
A Short Introduction





# History

- First published in 1978
- Updated every four years
- Developed by US Department of Transportation
- Joint effort between:
  - United States
  - Canada
  - Mexico
  - Argentina



# Components

The ERG is broken into five sections:

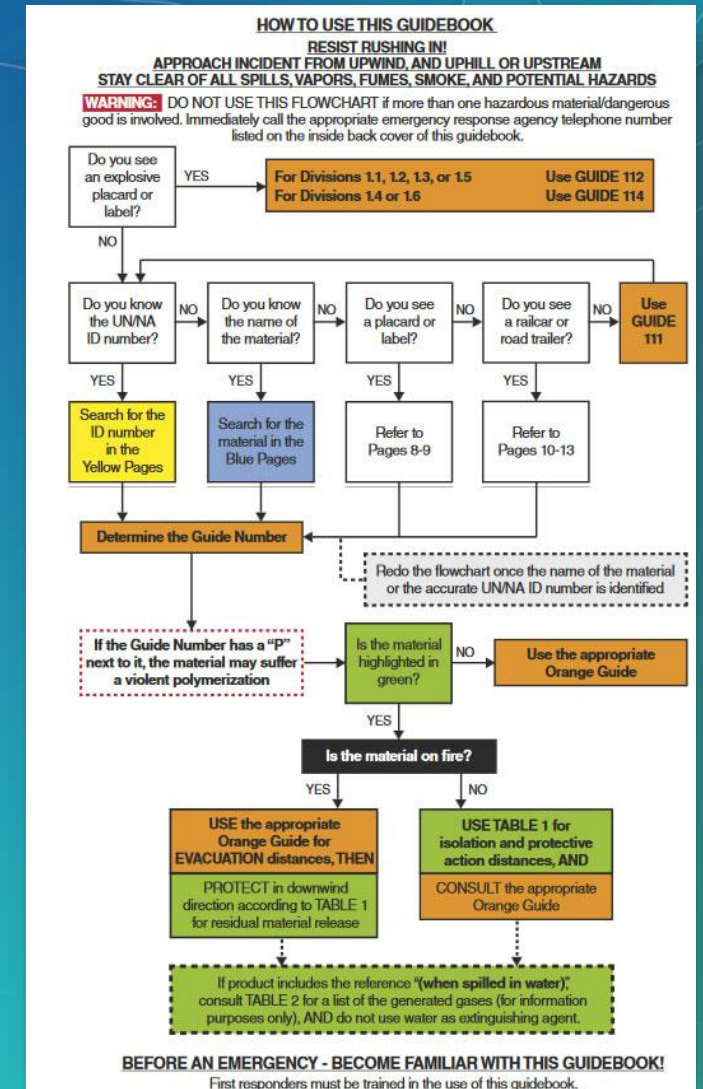
- White - Information
- Yellow - Reference
- Blue - Reference
- Orange - Response
- Green - Distances
- White - Information (again)



# Components

The White Section provides:

- Instructions on how to use the guidebook
- Information regarding shipping documents
- Guidance for hazardous material incident response
- Information on the hazard classification system
- General safety precautions
- ... and more!





# Components

The Yellow Section references the material in numerical order by assigned 4-digit UN/NA number.

ID Guide No. No.	Name of Material	ID Guide No. No.	Name of Material	ID Guide No. No.	Name of Material	ID Guide No. No.	Name of Material
1128 129	n-Butyl formate	1160 132	Dimethylamine, aqueous solution	1184 131	Ethylene dichloride	1204 127	Nitroglycerin, solution in alcohol, with not more than 1% Nitroglycerin
1129 129	Butyraldehyde	1160 132	Dimethylamine, solution	1185 131P	Ethyleneimine, stabilized	1206 128	Heptanes
1130 128	Camphor oil	1161 129	Dimethyl carbonate	1188 127	Ethylene glycol monomethyl ether	1207 130	Hexaldehyde
1131 131	Carbon bisulfide	1162 155	Dimethyldichlorosilane	1189 129	Ethylene glycol monomethyl ether acetate	1208 128	Hexanes
1131 131	Carbon bisulphide	1163 131	1,1-Dimethylhydrazine	1190 129	Ethyl formate	1208 128	Neohexane
1131 131	Carbon disulfide	1163 131	Dimethylhydrazine, unsymmetrical	1191 129	Ethylhexaldehydes	1210 129	Ink, printer's, flammable
1131 131	Carbon disulphide	1164 130	Dimethyl sulfide	1191 129	Ocyl aldehydes	1210 129	Printing ink, flammable
1133 128	Adhesives (flammable)	1164 130	Dimethyl sulphide	1192 129	Ethyl lactate	1210 129	Printing ink related material
1134 130	Chlorobenzene	1165 127	Dioxane	1193 127	Ethyl methyl ketone	1212 129	Isobutanol
1135 131	Ethylene chlorohydrin	1166 127	Dioxolane	1193 127	Methyl ethyl ketone	1212 129	Isobutyl alcohol
1136 128	Coal tar distillates, flammable	1167 128P	Divinyl ether, stabilized	1194 131	Ethyl nitrite, solution	1213 129	Isobutyl acetate
1139 127	Coating solution	1169 127	Extracts, aromatic, liquid	1195 129	Ethyl propionate	1214 132	Isobutylamine
1143 131P	Crotonaldehyde	1170 127	Ethanol	1196 155	Ethyltrichlorosilane	1216 128	Isocetenes
1143 131P	Crotonaldehyde, stabilized	1170 127	Ethanol, solution	1197 127	Extracts, flavoring, liquid	1218 130P	Isoprene, stabilized
1144 128	Crotonylene	1170 127	Ethyl alcohol	1197 127	Extracts, flavouring, liquid	1219 129	Isopropanol
1145 128	Cyclohexane	1170 127	Ethyl alcohol, solution	1198 132	Formaldehyde, solution, flammable	1219 129	Isopropyl alcohol
1146 128	Cyclopentane	1171 127	Ethylene glycol monoethyl ether	1198 132	Formalin (flammable)	1220 129	Isopropyl acetate
1147 130	Decahydronaphthalene	1172 129	Ethylene glycol monoethyl ether acetate	1199 132P	Furaldehydes	1221 132	Isopropylamine
1148 129	Diacetone alcohol	1173 129	Ethyl acetate	1199 132P	Furfural	1222 130	Isopropyl nitrate
1149 128	Butyl ethers	1175 130	Ethylbenzene	1199 132P	Furfuraldehydes	1223 128	Kerosene
1149 128	Diethyl ethers	1176 129	Ethyl borate	1201 127	Fusel oil	1224 127	Ketones, liquid, n.o.s.
1150 130P	1,2-Dichloroethylene	1177 130	2-Ethylbutyl acetate	1202 128	Diesel fuel	1228 131	Mercaptan mixture, liquid, flammable, poisonous, n.o.s.
1152 130	Dichloropentanes	1177 130	Ethylbutyl acetate	1202 128	Fuel oil	1228 131	Mercaptan mixture, liquid, flammable, toxic, n.o.s.
1153 127	Ethylene glycol diethyl ether	1178 130	2-Ethylbutylaldehyde	1202 128	Gas oil	1228 131	Mercaptans, liquid, flammable, poisonous, n.o.s.
1154 132	Diethylamine	1179 127	Ethyl butyl ether	1202 128	Heating oil, light	1228 131	Mercaptans, liquid, flammable, toxic, n.o.s.
1155 127	Diethyl ether	1180 130	Ethyl butyrate	1203 128	Gasohol	1229 129	Mesityl oxide
1155 127	Ethyl ether	1181 155	Ethyl chloroacetate	1203 128	Gasoline	1230 131	Methanol
1156 127	Ethyl methyl ketone	1182 155	Ethyl chloroformate	1203 128	Motor spirit	1230 131	Methyl alcohol
1157 128	Diisobutyl ketone	1183 139	Ethylchlorosilane	1203 128	Petrol		
1158 132	Diisopropylamine						
1159 127	Diisopropyl ether						


The Blue Section references the material in alphabetical order by name.

Name of Material	Guide No. No.	ID No.	Name of Material	Guide No. No.	ID No.	Name of Material	Guide No. No.	ID No.	Name of Material	Guide No. No.	ID No.
Boron trifluoride propionic acid complex	157	1743	Bromomethylpropanes	130	2342	tert-Butyl hypochlorite	135	3255	Calcium, pyrophoric	135	1855
Boron trifluoride propionic acid complex, liquid	157	1743	2-Bromo-2-nitropropane-1,3-diol	133	3241	N,n-Butylimidazole	152	2690	Calcium alloys, pyrophoric	135	1855
Boron trifluoride propionic acid complex, solid	157	3420	Bromopentane	130	2343	n-Butyl isocyanate	155	2485	Calcium arsenate	151	1573
Bromates, inorganic, aqueous solution, n.o.s.	140	3213	Bromopropanes	129	2344	tert-Butyl isocyanate	155	2485	Calcium arsenate and Calcium arsenite mixture, solid	151	1574
Bromates, inorganic, n.o.s.	141	1450	3-Bromopropyne	130	2345	Butyl mercaptan	130	2347	Calcium arsenite and Calcium arsenate mixture, solid	151	1574
Bromine	154	1748	Bromotrifluoroethane	116	2419	n-Butyl methacrylate, stabilized	130P	2227	Calcium carbide	138	1402
Bromine, solution	154	1748	Bromotrifluoromethane	126	1009	Butyl methyl ether	127	2350	Calcium carbide	138	1402
Bromine, solution (Inhalation Hazard Zone A)	154	1744	Brown asbestos	171	2212	Butyl nitrites	129	2351	Calcium chlorate	140	1452
Bromine, solution (Inhalation Hazard Zone B)	154	1744	Brucine	152	1570	Butyl propionates	130	1914	Calcium chlorate, aqueous solution	140	2429
Bromine chloride	124	2901	Butadienes, stabilized	116P	1010	Butyltoluenes	152	2667	Calcium chlorite	140	1453
Bromine pentafluoride	144	1748	Butadienes and hydrocarbon mixture, stabilized	116P	1010	Butyltrichlorosilane	155	1747	Calcium cyanamide, with more than 0.1% Calcium carbide	138	1403
Bromine trifluoride	144	1748	Butane	115	1011	5-tert-Butyl-2,4,6-trinitro-m-xylene	149	2956	Calcium cyanide	157	1575
Bromoacetic acid	156	1938	Butane	115	1075	Butyl vinyl ether, stabilized	127P	2352	Calcium dithionite	135	1923
Bromoacetic acid, solid	156	3425	Butanediol	127	2346	1,4-Butynediol	153	2716	Calcium hydride	138	1404
Bromoacetic acid, solution	156	1938	Butanols	129	1120	Butyraldehyde	129	1129	Calcium hydrosulfite	135	1923
Bromoacetone	131	1569	Butyl acetates	129	1123	Butyraldoxime	129	2840	Calcium hypochlorite, dry	140	1748
Bromoacetyl bromide	156	2513	Butyl acid phosphates	153	1718	Butyric acid	153	2820	Calcium hypochlorite, dry, corrosive, with more than 38% available chlorine (8.8% available oxygen)	140	3485
Bromobenzene	130	2514	Butyl acrylates, stabilized	129P	2348	Butyric anhydride	156	2739	Calcium hypochlorite, hydrated, corrosive, with not less than 5.5% but not more than 16% water	140	3487
Bromobenzyl cyanides, liquid	159	1694	n-Butylamine	132	1125	Butyronitrile	131	2411	Calcium hypochlorite, hydrated, with not less than 5.5% but not more than 16% water	140	3487
Bromobenzyl cyanides, solid	159	1694	N-Butylaniline	153	2738	Butyltrichlorosilane	132	2353	Calcium hypochlorite, hydrated, with not less than 5.5% but not more than 16% water	140	3487
Bromobenzyl cyanides, solid	159	1694	Butylbenzenes	128	2709	Buzz	153	2810	Calcium hypochlorite, hydrated, with not less than 5.5% but not more than 16% water	140	3487
1-Bromobutane	130	1126	n-Butyl bromide	130	1126	BZ	153	2810	Calcium hypochlorite, hydrated, with not less than 5.5% but not more than 16% water	140	3487
2-Bromobutane	130	2339	n-Butyl chloride	130	1127	CA	159	1888	Calcium hypochlorite, hydrated, with not less than 5.5% but not more than 16% water	140	3487
Bromochloromethane	160	1887	n-Butyl chloroformate	155	2741	Cacodylic acid	151	1572	Calcium hypochlorite, hydrated, with not less than 5.5% but not more than 16% water	140	3487
1-Bromo-3-chloropropane	159	2888	sec-Butyl chloroformate	155	2742	Cadmium compound	154	2570	Calcium hypochlorite, hydrated, with not less than 5.5% but not more than 16% water	140	3487
2-Bromoethyl ethyl ether	130	2340	tert-Butyl cyclohexyl chloroformate	156	2747	Caesium	138	1407	Calcium hypochlorite, hydrated, with not less than 5.5% but not more than 16% water	140	3487
Bromofarm	159	2515	Butylene	115	1012	Caesium hydroxide	157	2882	Calcium hypochlorite, hydrated, with not less than 5.5% but not more than 16% water	140	3487
1-Bromo-3-methylbutane	130	2341	Butylene oxide, stabilized	115	1075	Caesium hydroxide, solution	154	2681	Calcium hypochlorite, hydrated, with not less than 5.5% but not more than 16% water	140	3487
			Butyl ethers	128	1149	Caesium nitrate	140	1451	Calcium hypochlorite, hydrated, with not less than 5.5% but not more than 16% water	140	3487
			n-Butyl formate	129	1128	Calcium	138	1401			

# Components

The Orange Section provides safety recommendations and directions during the initial response phase. It includes:

- Potential Hazards
  - Health
  - Fire or Explosion
- Public Safety
  - Protective Clothing
  - Evacuation
- Emergency Response
  - Fire
  - Spill or Leak
  - First Aid

GUIDE 115 GASES - FLAMMABLE (INCLUDING REFRIGERATED LIQUIDS)	GASES - FLAMMABLE (INCLUDING REFRIGERATED LIQUIDS) GUIDE 115
POTENTIAL HAZARDS	EMERGENCY RESPONSE
<p><b>FIRE OR EXPLOSION</b></p> <ul style="list-style-type: none"><li>• <b>EXTREMELY FLAMMABLE.</b></li><li>• Will be easily ignited by heat, sparks or flames.</li><li>• Will form explosive mixtures with air.</li><li>• Vapors from liquefied gas are initially heavier than air and spread along ground.</li></ul> <p><b>CAUTION:</b> Hydrogen (UN1049), Deuterium (UN1957), Hydrogen, refrigerated liquid (UN1966) and Methane (UN1971) are lighter than air and will rise. Hydrogen and Deuterium fires are difficult to detect since they burn with an invisible flame. Use an alternate method of detection (thermal camera, broom handle, etc.)</p> <ul style="list-style-type: none"><li>• Vapors may travel to source of ignition and flash back.</li><li>• Cylinders exposed to fire may vent and release flammable gas through pressure relief devices.</li><li>• Containers may explode when heated.</li><li>• Ruptured cylinders may rocket.</li></ul> <p><b>HEALTH</b></p> <ul style="list-style-type: none"><li>• Vapors may cause dizziness or asphyxiation without warning.</li><li>• Some may be irritating if inhaled at high concentrations.</li><li>• Contact with gas or liquefied gas may cause burns, severe injury and/or frostbite.</li><li>• Fire may produce irritating and/or toxic gases.</li></ul> <p><b>PUBLIC SAFETY</b></p> <ul style="list-style-type: none"><li>• <b>CALL EMERGENCY RESPONSE Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.</b></li><li>• As an immediate precautionary measure, isolate spill or leak area for at least 100 meters (330 feet) in all directions.</li><li>• Keep unauthorized personnel away.</li><li>• Stay upwind, uphill and/or upstream.</li><li>• Many gases are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks).</li></ul> <p><b>PROTECTIVE CLOTHING</b></p> <ul style="list-style-type: none"><li>• Wear positive pressure self-contained breathing apparatus (SCBA).</li><li>• Structural firefighters' protective clothing will only provide limited protection.</li><li>• Always wear thermal protective clothing when handling refrigerated/cryogenic liquids.</li></ul> <p><b>EVACUATION</b></p> <p><b>Large Spill</b></p> <ul style="list-style-type: none"><li>• Consider initial downwind evacuation for at least 800 meters (1/2 mile).</li></ul> <p><b>Fire</b></p> <ul style="list-style-type: none"><li>• If tank, rail car or tank truck is involved in a fire, ISOLATE for 1600 meters (1 mile) in all directions; also, consider initial evacuation for 1600 meters (1 mile) in all directions.</li><li>• In fires involving Liquefied Petroleum Gases (LPG) (UN1075); Butane, (UN1011); Butylene, (UN1012); Isobutylene, (UN1055); Propylene, (UN1077); Isobutane, (UN1969); and Propane, (UN1978), also refer to BLEVE - SAFETY PRECAUTIONS (Page 368)</li></ul> <p> In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping document and/or the ERAP Program Section (page 391).</p>	<p><b>FIRE</b></p> <ul style="list-style-type: none"><li>• <b>DO NOT EXTINGUISH A LEAKING GAS FIRE UNLESS LEAK CAN BE STOPPED.</b></li></ul> <p><b>CAUTION:</b> Hydrogen (UN1049), Deuterium (UN1957) and Hydrogen, refrigerated liquid (UN1966) burn with an invisible flame. Hydrogen and Methane mixture, compressed (UN2034) may burn with an invisible flame.</p> <p><b>Small Fire</b></p> <ul style="list-style-type: none"><li>• Dry chemical or CO<sub>2</sub>.</li></ul> <p><b>Large Fire</b></p> <ul style="list-style-type: none"><li>• Water spray or fog.</li><li>• Move containers from fire area if you can do it without risk.</li></ul> <p><b>Fire Involving Tanks</b></p> <ul style="list-style-type: none"><li>• Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.</li><li>• Cool containers with flooding quantities of water until well after fire is out.</li><li>• Do not direct water at source of leak or safety devices; icing may occur.</li><li>• Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.</li><li>• ALWAYS stay away from tanks engulfed in fire.</li><li>• For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.</li></ul> <p><b>SPILL OR LEAK</b></p> <ul style="list-style-type: none"><li>• ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area).</li><li>• All equipment used when handling the product must be grounded.</li><li>• Do not touch or walk through spilled material.</li><li>• Stop leak if you can do it without risk.</li><li>• If possible, turn leaking containers so that gas escapes rather than liquid.</li><li>• Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material.</li><li>• Do not direct water at spill or source of leak.</li><li>• Prevent spreading of vapors through sewers, ventilation systems and confined areas.</li><li>• Isolate area until gas has dispersed.</li></ul> <p><b>CAUTION:</b> When in contact with refrigerated/cryogenic liquids, many materials become brittle and are likely to break without warning.</p> <p><b>FIRST AID</b></p> <ul style="list-style-type: none"><li>• Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.</li><li>• Move victim to fresh air.</li><li>• Call 911 or emergency medical service.</li><li>• Give artificial respiration if victim is not breathing.</li><li>• Administer oxygen if breathing is difficult.</li><li>• Remove and isolate contaminated clothing and shoes.</li><li>• Clothing frozen to the skin should be thawed before being removed.</li><li>• In case of contact with liquefied gas, thaw frosted parts with lukewarm water.</li><li>• In case of burns, immediately cool affected skin for as long as possible with cold water. Do not remove clothing if adhering to skin.</li><li>• Keep victim calm and warm.</li></ul>
Page 168	Page 169



# Components

The Green Section provides initial evacuation or protective action distances, and specific guidance for:

- Materials that are Toxic-by-Inhalation (TIH)
- Toxic gases that are produced on contact with water
- Six materials commonly transported in bulk

Page 266

TABLE 1 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES

Page 296

			SMALL SPILLS (From a small package or small leak from a large package)				LARGE SPILLS (From a large package or from many small packages)			
			First ISOLATE in all Directions	Then PROTECT persons Downwind during		First ISOLATE in all Directions	Then PROTECT persons Downwind during			
ID No.	Guide	NAME OF MATERIAL	Meters (Feet)	DAY Kilometers (Miles)	NIGHT Kilometers (Miles)	Meters (Feet)	DAY Kilometers (Miles)	NIGHT Kilometers (Miles)		
1005	125	Ammonia, anhydrous	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	Refer to table 3				
1005	125	Anhydrous ammonia								
1008	125	Boron trifluoride	30 m (100 ft)	0.1 km (0.1 mi)	0.7 km (0.4 mi)	400 m (1250 ft)	2.2 km (1.4 mi)	4.8 km (3.0 mi)		
1008	125	Boron trifluoride, compressed								
1016	119	Carbon monoxide								
1016	119	Carbon monoxide, compressed	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	200 m (600 ft)	1.2 km (0.7 mi)	4.4 km (2.8 mi)		
1017	124	Chlorine	60 m (200 ft)	0.3 km (0.2 mi)	1.1 km (0.7 mi)	Refer to table 3				
1026	119	Cyanogen	30 m (100 ft)	0.1 km (0.1 mi)	0.4 km (0.3 mi)	60 m (200 ft)	0.3 km (0.2 mi)	1.1 km (0.7 mi)		
1040	119P	Ethylene oxide								
1040	119P	Ethylene oxide with Nitrogen	30 m (100 ft)	0.1 km (0.1 mi)	0.2 km (0.1 mi)	Refer to table 3				

Page 356

TABLE 3 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES FOR LARGE SPILLS FOR DIFFERENT QUANTITIES OF SIX COMMON TIH (PIH in the US) GASES

	First ISOLATE in all Directions	Then PROTECT persons Downwind during							
		DAY						NIGHT	
		Low wind ( $\leq 6$ mph = < 10 km/h)	Moderate wind (6-12 mph = 10 - 20 km/h)	High wind ( $> 12$ mph = > 20 km/h)	Low wind ( $\leq 6$ mph = < 10 km/h)	Moderate wind (6-12 mph = 10 - 20 km/h)	High wind ( $> 12$ mph = > 20 km/h)		
		Meters (Feet)	km (Miles)	km (Miles)	km (Miles)	km (Miles)	km (Miles)		
TRANSPORT CONTAINER	UN1040 Ethylene oxide: Large Spills								
Rail tank car	200 (600)	1.6 (1.0)	0.8 (0.5)	0.7 (0.5)	3.3 (2.1)	1.4 (0.9)	0.8 (0.5)		
Highway tank truck or trailer	100 (300)	0.9 (0.6)	0.5 (0.3)	0.4 (0.3)	2.0 (1.3)	0.7 (0.4)	0.4 (0.3)		
Multiple small cylinders or single ton cylinder	30 (100)	0.4 (0.3)	0.2 (0.1)	0.1 (0.1)	0.9 (0.6)	0.3 (0.2)	0.2 (0.1)		
TRANSPORT CONTAINER	UN1050 Hydrogen chloride, anhydrous: Large Spills UN2186 Hydrogen chloride, refrigerated liquid: Large Spills								
Rail tank car	500 (1500)	3.7 (2.3)	2.0 (1.2)	1.7 (1.1)	9.9 (6.2)	3.4 (2.1)	2.3 (1.5)		
Highway tank truck or trailer	200 (600)	1.5 (0.9)	0.8 (0.5)	0.6 (0.4)	3.8 (2.4)	1.5 (0.9)	0.8 (0.5)		
Multiple ton cylinders	30 (100)	0.4 (0.3)	0.2 (0.1)	0.1 (0.1)	1.1 (0.7)	0.3 (0.2)	0.2 (0.1)		
Multiple small cylinders or single ton cylinder	30 (100)	0.3 (0.2)	0.2 (0.1)	0.1 (0.1)	0.9 (0.6)	0.3 (0.2)	0.2 (0.1)		

Page 357

TABLE 3 - INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES FOR LARGE SPILLS FOR DIFFERENT QUANTITIES OF SIX COMMON TIH (PIH in the US) GASES

	First ISOLATE in all Directions	Then PROTECT persons Downwind during							
		DAY				NIGHT			
		Low wind ( $< 6$ mph = $< 10$ km/h)	Moderate wind (6-12 mph = 10-20 km/h)	High wind ( $> 12$ mph = $> 20$ km/h)	Low wind ( $< 6$ mph = $< 10$ km/h)	Moderate wind (6-12 mph = 10-20 km/h)	High wind ( $> 12$ mph = $> 20$ km/h)		
		Meters (Feet)	km (Miles)	km (Miles)	km (Miles)	km (Miles)	km (Miles)	km (Miles)	
		TRANSPORT CONTAINER UN1052 Hydrogen fluoride, anhydrous: Large Spills							
Rail tank car	400 (1250)	3.1 (1.9)	1.9 (1.2)	1.6 (1.0)	6.1 (3.8)	2.9 (1.8)	1.9 (1.2)		
Highway tank truck or trailer	200 (700)	1.9 (1.2)	1.0 (0.7)	0.9 (0.6)	3.4 (2.2)	1.6 (1.0)	0.9 (0.6)		
Multiple small cylinders or single ton cylinder	100 (300)	0.8 (0.5)	0.4 (0.2)	0.3 (0.2)	1.6 (1.0)	0.5 (0.3)	0.3 (0.2)		
	TRANSPORT CONTAINER	UN1079 Sulfur dioxide/Sulphur dioxide: Large Spills							
		Rail tank car	1000 (3000)	11+ (7+)	11+ (7+)	7.0 (4.4)	11+ (7+)	11+ (7+)	9.8 (6.1)
		Highway tank truck or trailer	1000 (3000)	11+ (7+)	5.8 (3.6)	5.0 (3.1)	11+ (7+)	8.0 (5.0)	6.1 (3.8)
		Multiple ton cylinders	500 (1500)	5.2 (3.2)	2.4 (1.5)	1.8 (1.1)	7.5 (4.7)	4.0 (2.5)	2.8 (1.7)
		Multiple small cylinders or single ton cylinder	200 (600)	3.1 (1.9)	1.5 (0.9)	1.1 (0.7)	5.6 (3.5)	2.4 (1.5)	1.5 (0.9)

\*+\* means distance can be larger in certain atmospheric conditions

# Components

The White Section at the back of the guide provides:

- Information regarding protective clothing and equipment
- Instructions on fire and spill control
- BLEVE (boiling liquid expanding vapor explosion) safety precautions
- Improvised Explosive Devices (IEDs) and for hazardous materials being used for terrorism
- Glossary
- Emergency Contact information
- ... and more!

Page 374

Improvised Explosive Device (IED)  
SAFE STAND-OFF DISTANCE

Threat Description		Explosives Capacity <sup>1</sup>		Mandatory Evacuation Distance <sup>2</sup>		Shelter-in-Place Zone		Preferred Evacuation Distance <sup>3</sup>	
High Explosive (NT Equivalent)	Pipe Bomb	5 lbs	2.3 kg	70 ft	21 m	71 - 1,199 ft	22 - 365 m	+1,200 ft	366 m
	Suicide Bomber	20 lbs	9 kg	110 ft	34 m	111 - 1,699 ft	35 - 518 m	+1,700 ft	519 m
	Briefcase/Suitcase	50 lbs	23 kg	150 ft	46 m	151 - 1,849 ft	47 - 563 m	+1,850 ft	564 m
	Car	500 lbs	227 kg	320 ft	98 m	321 - 1,899 ft	99 - 579 m	+1,900 ft	580 m
	SUV/Minivan	1,000 lbs	454 kg	400 ft	122 m	401 - 2,399 ft	123 - 731 m	+2,400 ft	732 m
	Small Delivery Truck	4,000 lbs	1,814 kg	640 ft	195 m	641 - 3,799 ft	196 - 1,158 m	+3,800 ft	1,159 m
	Container/Water Truck	10,000 lbs	4,536 kg	860 ft	263 m	861 - 5,099 ft	264 - 1,554 m	+5,100 ft	1,555 m
	Semi-Trailer	60,000 lbs	27,216 kg	1,570 ft	475 m	1,571 - 9,299 ft	476 - 2,834 m	+9,300 ft	2,835 m

<sup>1</sup> Based on the maximum amount of material that could reasonably fit into a container or vehicle. Variations possible.

<sup>2</sup> Governed by the ability of an unreinforced building to withstand severe damage or collapse.

<sup>3</sup> Governed by the greater of fragment throw distance or glass breakage/falling glass hazard distance. These distances can be reduced for personnel wearing ballistic protection. Note that the pipe bomb, suicide bomb, and briefcase/suitcase bomb are assumed to have a fragmentation characteristic that requires greater stand-off distances than an equal amount of explosives in a vehicle.

Improvised Explosive Device (IED)  
SAFE STAND-OFF DISTANCE

ate and should only be used with extreme caution. These times can vary from situation to situation. to BLEVE within minutes. Therefore, never risk life based on these times.

BLEVE  
(USE WITH CAUTION)

	Minimum time to failure for severe torch	Approximate time to empty for engulfing fire	Fireball radius	Emergency response distance	Minimum evacuation distance	Preferred evacuation distance	Cooling water flow rate
Pounds	Minutes	Minutes	Meters (Feet)	Meters (Feet)	Meters (Feet)	Meters (Feet)	Litres/min USgal/min
(88)	4	8	10 (33)	90 (295)	154 (505)	307 (1007)	94.6 25
(353)	4	12	16 (53)	90 (295)	244 (801)	488 (1601)	189.3 50
(1764)	5	18	28 (92)	111 (364)	417 (1368)	834 (2736)	424 112
(8527)	5	20	35 (115)	140 (459)	525 (1722)	1050 (3445)	598 158
(7055)	6	22	44 (144)	176 (577)	661 (2169)	1323 (4341)	848 224
(19400)	7	28	62 (203)	247 (810)	926 (3038)	1852 (6076)	1404 371
(37037)	7	32	77 (253)	306 (1004)	1149 (3770)	2200 (7218)	1908 512
(72310)	8	40	96 (315)	383 (1257)	1435 (4708)	2200 (7218)	2710 716
(123457)	9	45	114 (374)	457 (1499)	1715 (5627)	2200 (7218)	3539 935

	Fireball Diameter <sup>2</sup>		Safe Distance <sup>3</sup>	
9 L	40 ft	12 m	160 ft	48 m
6 L	68 ft	21 m	276 ft	84 m
3 L	184 ft	56 m	736 ft	224 m
1.5 L	292 ft	89 m	1,168 ft	356 m
0.5 L	498 ft	152 m	1,996 ft	608 m

at an LPG tank filled with high explosives would require a

# Emergency Response Guide Widget

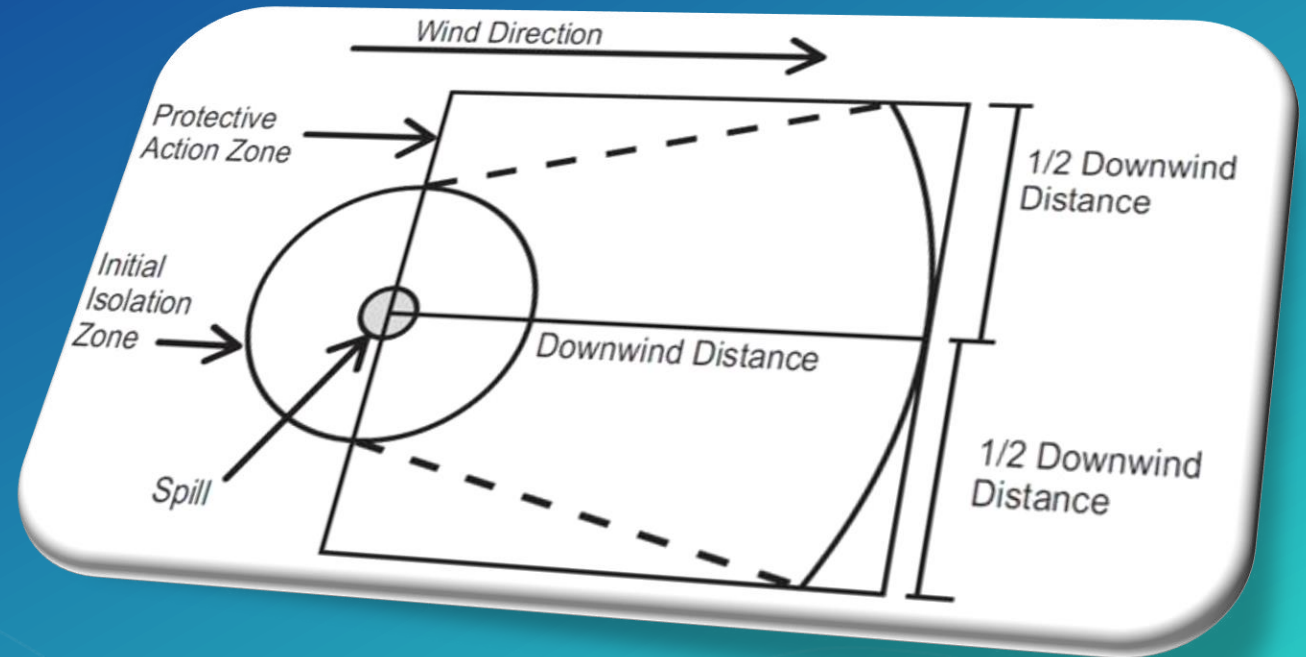
The Evolution of the Emergency Response Guide Widget





# Development

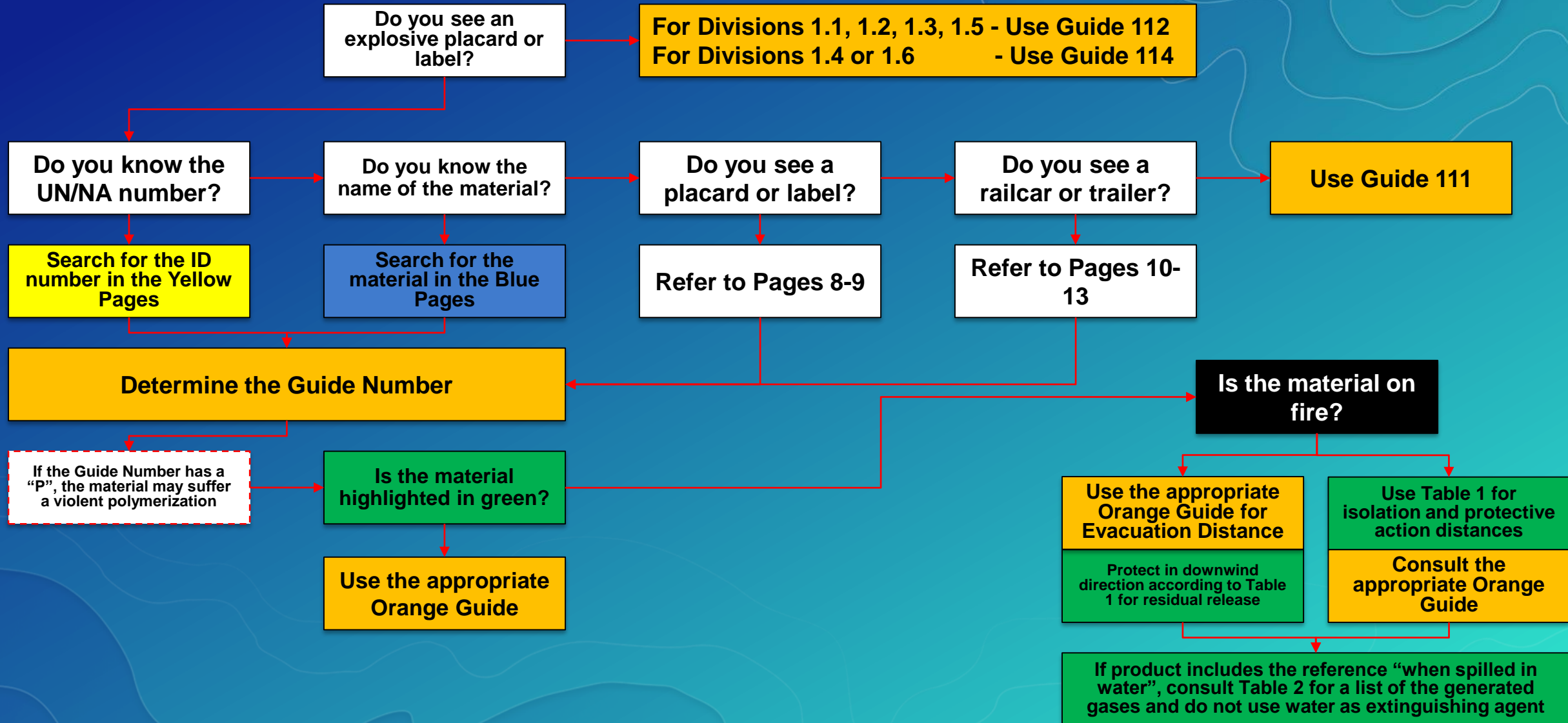
- Developed by Local Government
- First published in 2009
  - Flex Viewer widget
  - 2008 values
  - Geoprocessing tools
- Updated in 2013
  - JavaScript widget
  - Updated to 2012 values
  - Added demographic logic



# Recent Updates

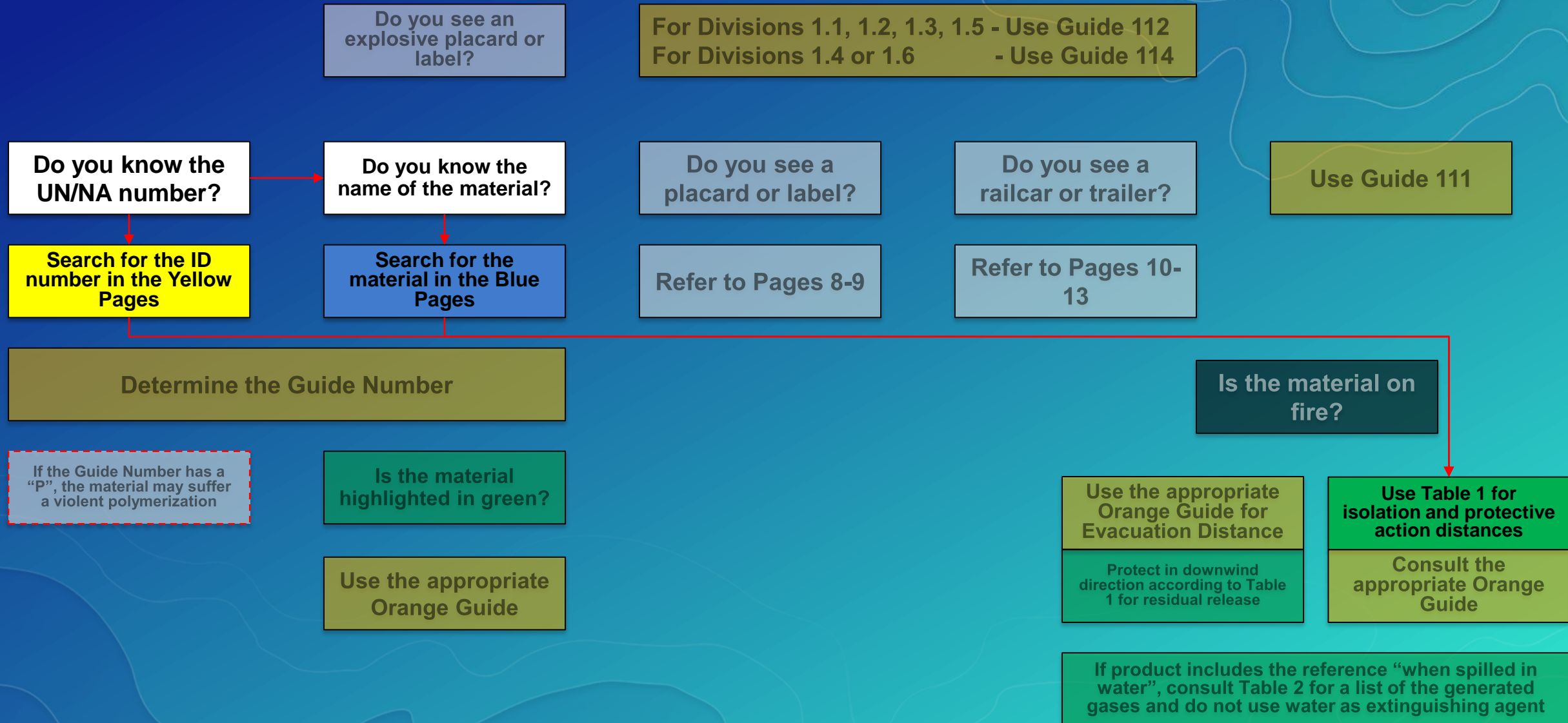
- Updated to 2016 values
  - All values, not just Table I
  - Human-readable names added
- UI adjustments
- New data tables
  - Table 3 – Toxic Inhalation Hazards (TIH)
  - Boiling Liquid Expanding Vapor Explosion (BLEVE)
  - Orange Section Distances
    - Public Safety
    - Evacuation
- No logic updates

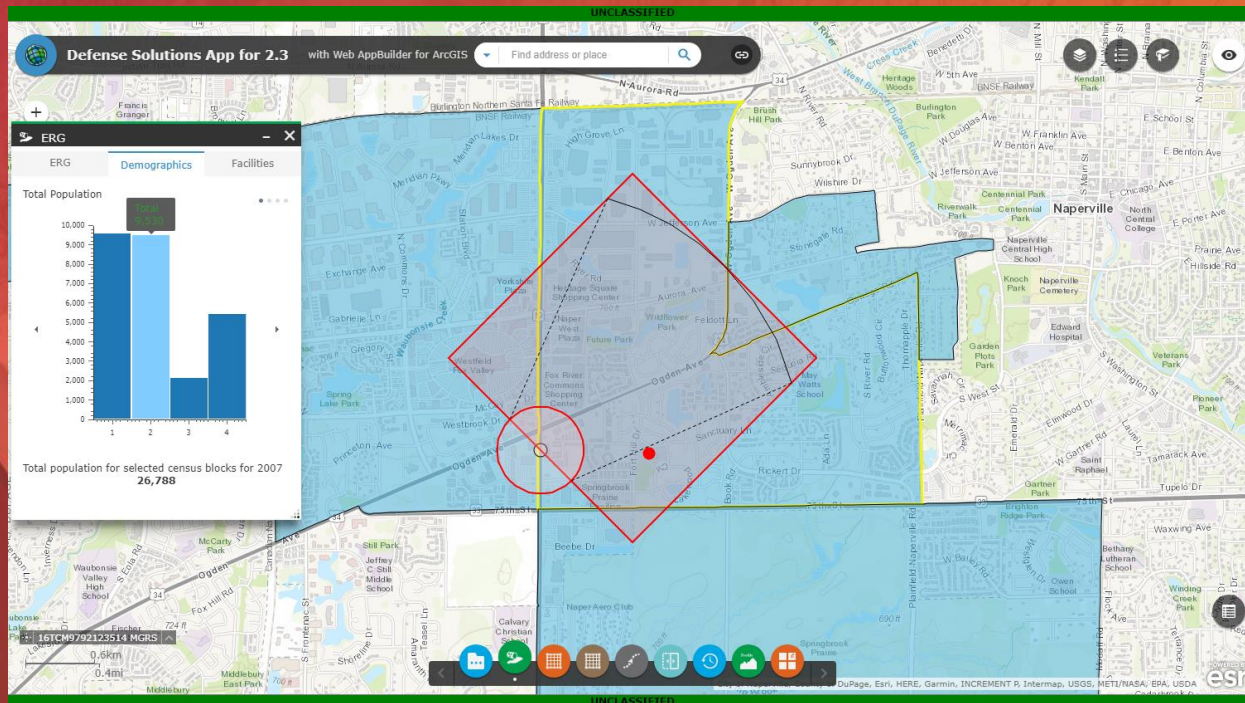
# ERG Book Workflow





# ERG Widget 1.x Workflow





# Demonstration

Using the ERG Widget



# Downloading the Solution

The screenshot shows the GitHub repository page for `Esri/solutions-webappbuilder-widgets`. The URL `https://github.com/Esri/solutions-webappbuilder-widgets` is highlighted in the address bar and a callout box. A red arrow points to the `ERG` folder in the file list.

Repository details:

- Repository: `Esri / solutions-webappbuilder-widgets`
- Unwatch: 117
- Star: 120
- Fork: 147
- Code: 64
- Issues: 64
- Pull requests: 0
- Projects: 0
- Wiki
- Settings
- Insights

Repository statistics:

- 1,070 commits
- 29 branches
- 7 releases
- 29 contributors
- Apache-2.0 license

Branch: dev | New pull request

Actions: Create new file | Upload files | Find file | Clone or download

Latest commit: 5adecb5 2 days ago

File/Folder	Description	Time
BombThreat	Fixed height of accordion class	2 days ago
CI_KR_Chart	Update style.css	3 days ago
CoordinateConversion	CSS updates	9 days ago
DistanceAndDirection	Addressed issue #915	4 days ago
ERG	Update strings.js	4 months ago
ElevationProfileTable	Update README.md	10 months ago
FilterEditor	Update README.md	10 months ago
GRG	CSS updates	9 days ago
GridOverlay	updated a couple of icons	29 days ago
ImageDiscovery	Fixed Services not showing up in search results	a year ago
InfoSummary	2.5 release	2 days ago
NetworkTrace	This modification allows multiple network trace widgets to be configu...	a year ago

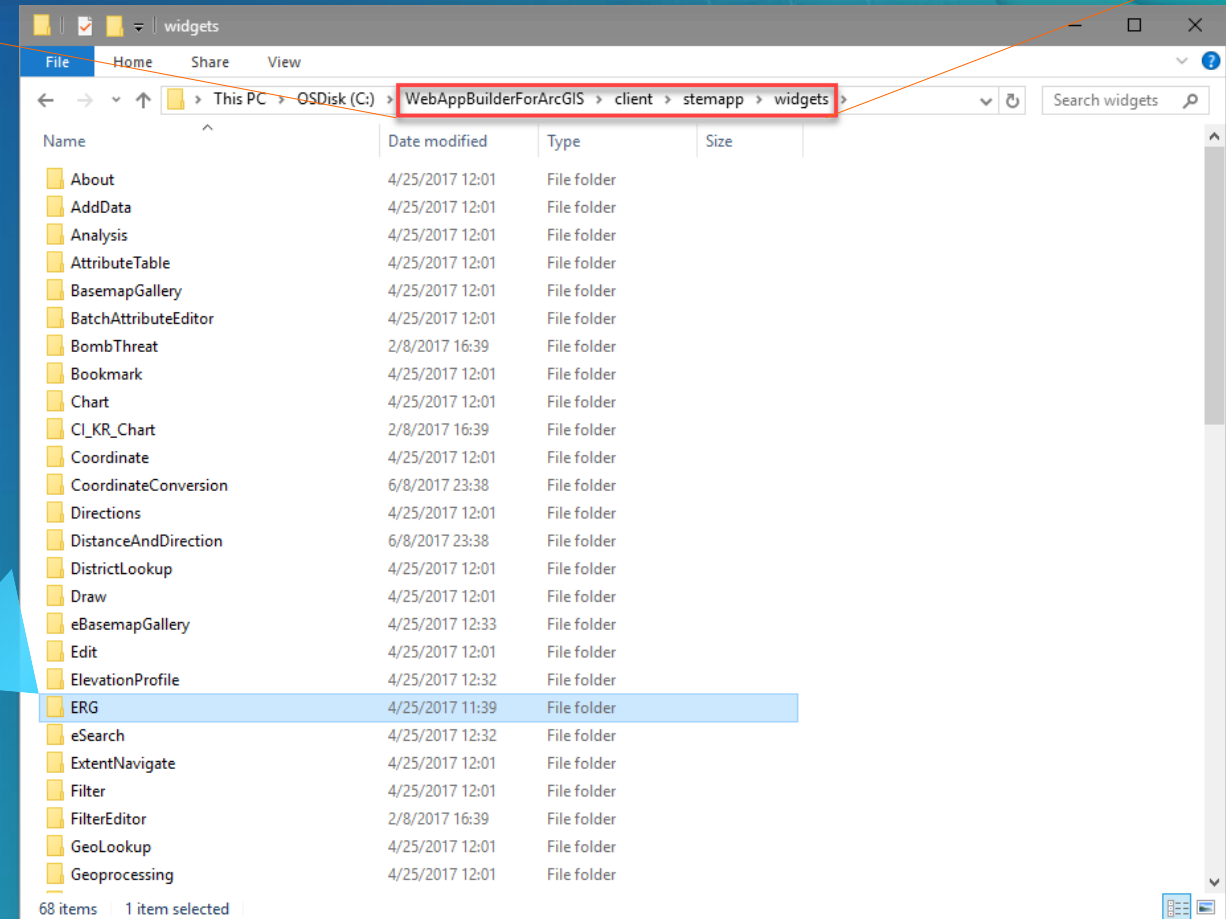


# Installing the ERG Widget

Copy widget folder from source to your instance of Web AppBuilder (Dev Edition)

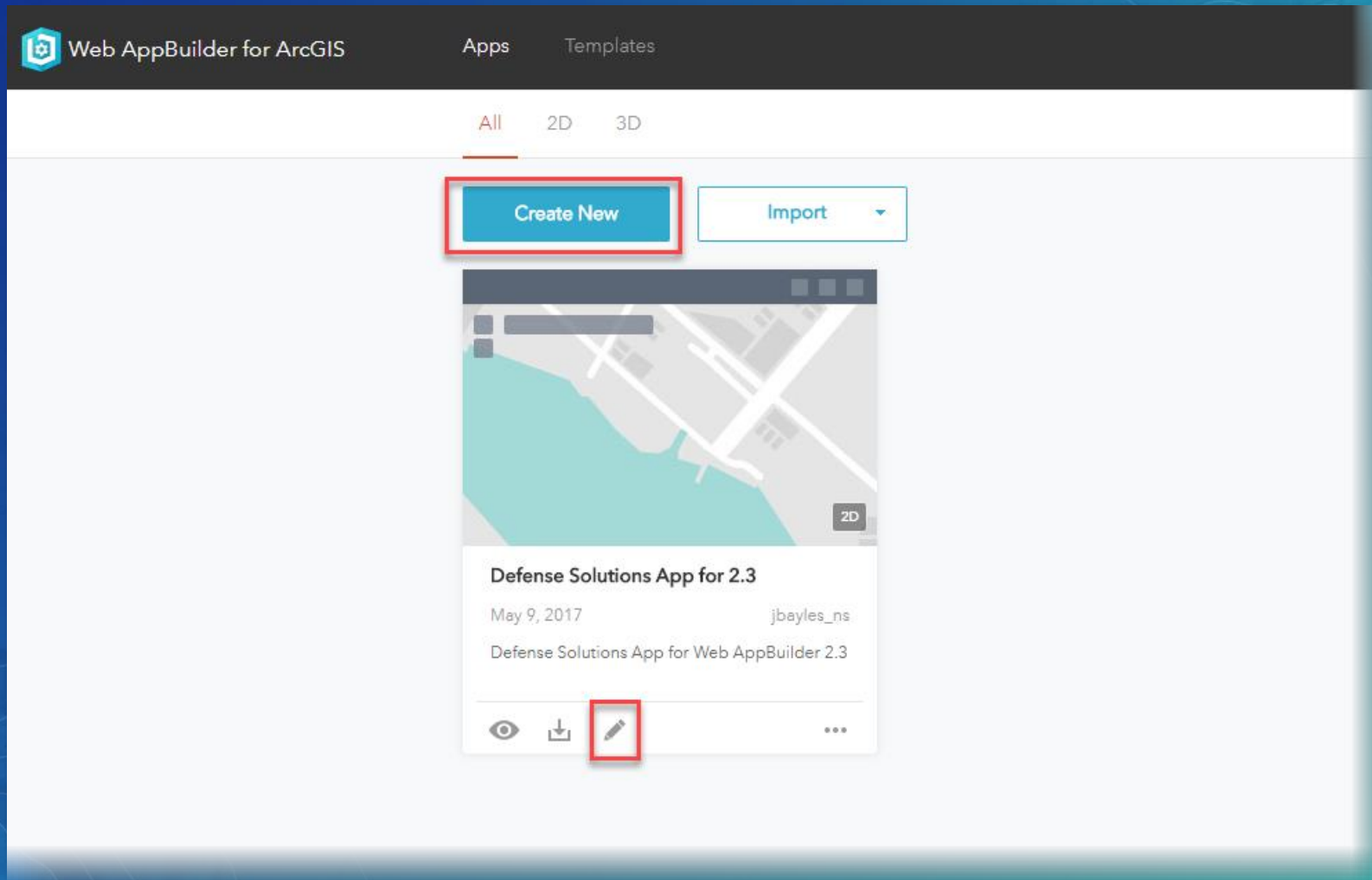
WebAppBuilderForArcGIS > client > stemapp > widgets

At ArcGIS Enterprise 10.5.1, custom widgets can be added to hosted Web AppBuilder as a Portal item type



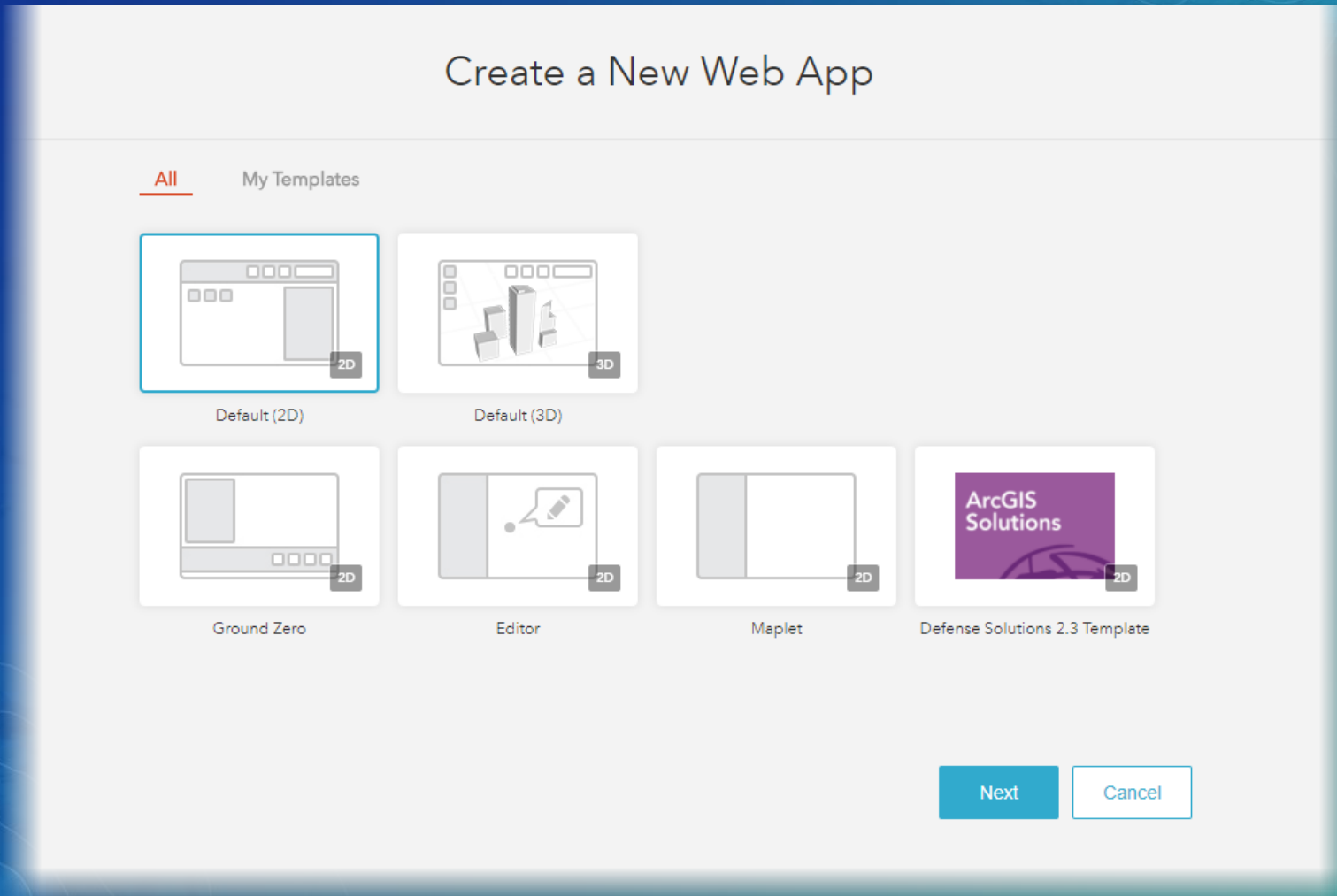
# Creating a new App

Create a new app inside Web AppBuilder



# Creating a new App

Create a new app inside Web AppBuilder

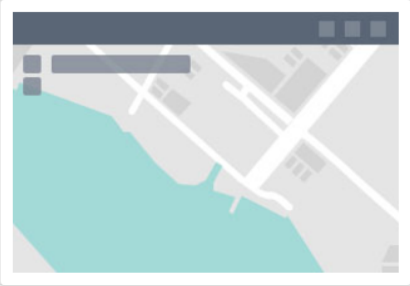




# Creating a new App


Create a new app inside Web AppBuilder

## Create a New Web App



Title

Description



Back

OK

Cancel

# Creating a new App

## Create a new app inside Web AppBuilder

Web AppBuilder for ArcGIS Emergency Response App Joe ▾

Theme Map Widget Attribute

Emergency Response App with Web AppBuilder for ArcGIS

Find address or place

1 2 3 4 5

Arctic Ocean

Arctic Ocean

Pacific Ocean

Pacific Ocean

Atlantic Ocean

Indian Ocean

Pacific Ocean

NORTH AMERICA

SOUTH AMERICA

EUROPE

AFRICA

ASIA

AUSTRALIA

ANTARCTICA

Billboard Theme

Box Theme

Dart Theme

Foldable Theme

Jewelry Box Theme

Launchpad Theme

Plateau Theme

Tab Theme

Style

Layout

Launch | Previews | Saved

600mi

-156.445 39.803 Degrees

Esri, HERE, FAO, NOAA

POWERED BY esri

# Configuring the App

Select themes, maps, and configure application attributes

The 'Theme' tab is selected in the top navigation bar. It displays a grid of nine theme options: Billboard Theme, Box Theme, Dart Theme, Foldable Theme (highlighted with a blue border), Jewelry Box Theme, Launchpad Theme, Plateau Theme, and Tab Theme. Below the themes, there is a 'Style' section with a row of color swatches, where the first grey swatch is highlighted. At the bottom, there is a 'Layout' section with four different layout templates, the first of which is also highlighted.

Theme | Map | Widget | Attribute

Billboard Theme | Box Theme | Dart Theme

Foldable Theme | Jewelry Box Theme | Launchpad Theme

Plateau Theme | Tab Theme

Style

Layout

Launch | Previews | Saved

The 'Map' tab is selected in the top navigation bar. It shows a preview of a topographic map of Lewistown, PA. To the right of the map, there is a 'Web Map' section with the owner 'esri\_en', last modified date '3/8/2012', and a 'More Details...' link. Below this is a 'Choose Web Map' button. The 'Topographic' section describes the map as a basemap and reference map. The 'Set Initial Extent' section has two buttons: 'Use Current Map View' and 'Use Web Map's Default Extent'. The 'Customize Visible Scales' section has a 'Customize...' button.

Theme | Map | Widget | Attribute

Web Map  
Owner esri\_en  
Last Modified: 3/8/2012  
More Details...  
Choose Web Map

Topographic

This topographic map is designed to be used as a basemap and a reference map. The map has been compiled by Esri and the ArcGIS user community from a variety of best available sources.

Set Initial Extent

Specify the initial map extent when the application starts up.

Use Current Map View

Use Web Map's Default Extent

Customize Visible Scales

Customize the visible scales of the map to limit or extend the scale levels which the map can zoom to.

Customize...

Launch | Previews | Save

The 'Attribute' tab is selected in the top navigation bar. It contains three main sections: 'Branding', 'Links', and 'App state'. The 'Branding' section has input fields for 'Emergency Response App' and 'with Web AppBuilder for ArcGIS'. The 'Links' section has an 'Add New Link' button. The 'App state' section has a checked checkbox for 'Keeps map extent and layers visibility while leaving the app.'. The 'Loading screen' section has a right-pointing arrow and a description. At the bottom, there are 'Launch', 'Previews', and 'Save' buttons.

Theme | Map | Widget | Attribute

Branding

Add logo, title, or subtitle for your app.

Emergency Response App A

with Web AppBuilder for ArcGIS A

Links

+ Add New Link

App state

☒ Keeps map extent and layers visibility while leaving the app.

Loading screen

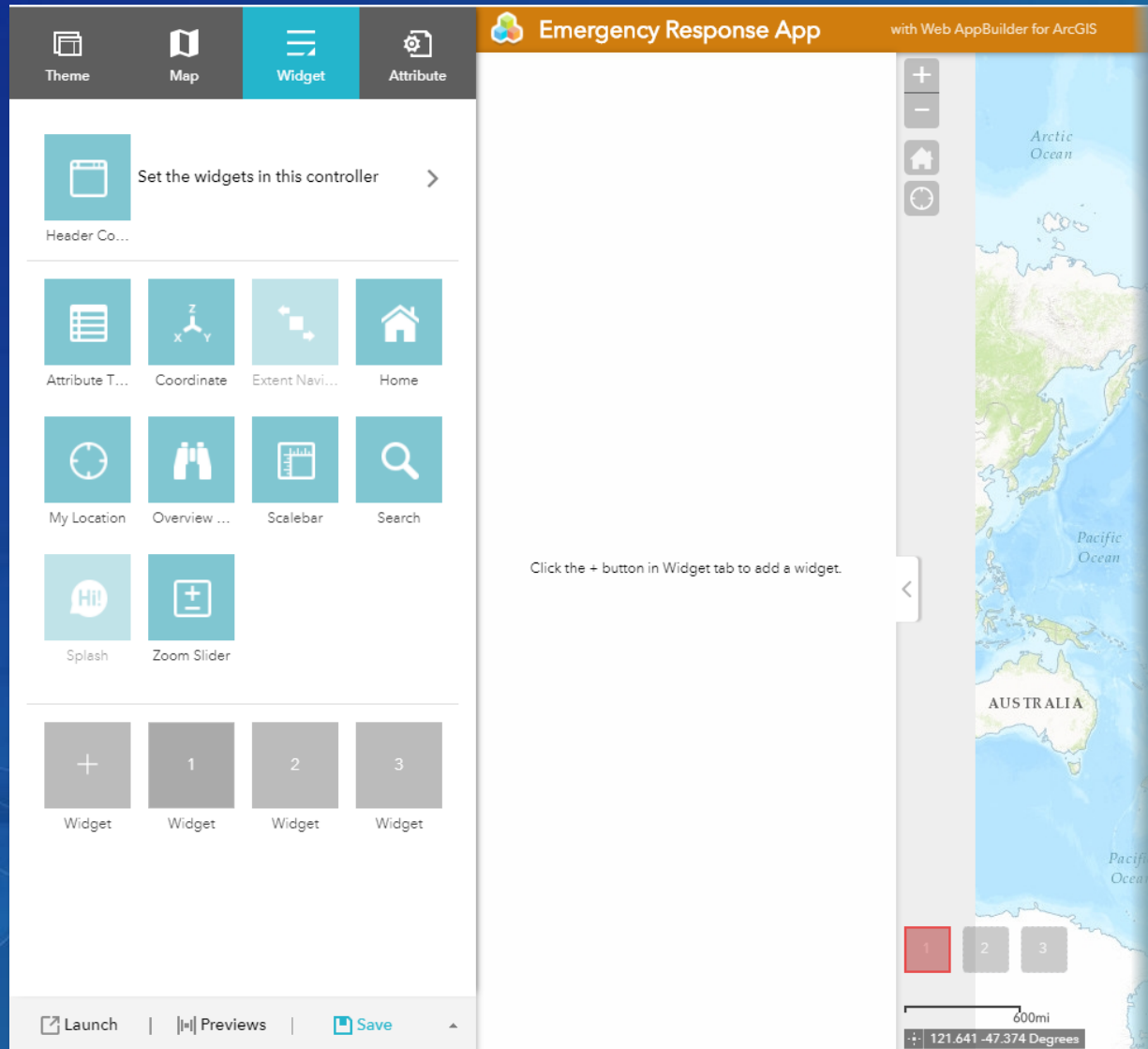
Configure background and loading icon for the loading screen.

Launch | Previews | Save



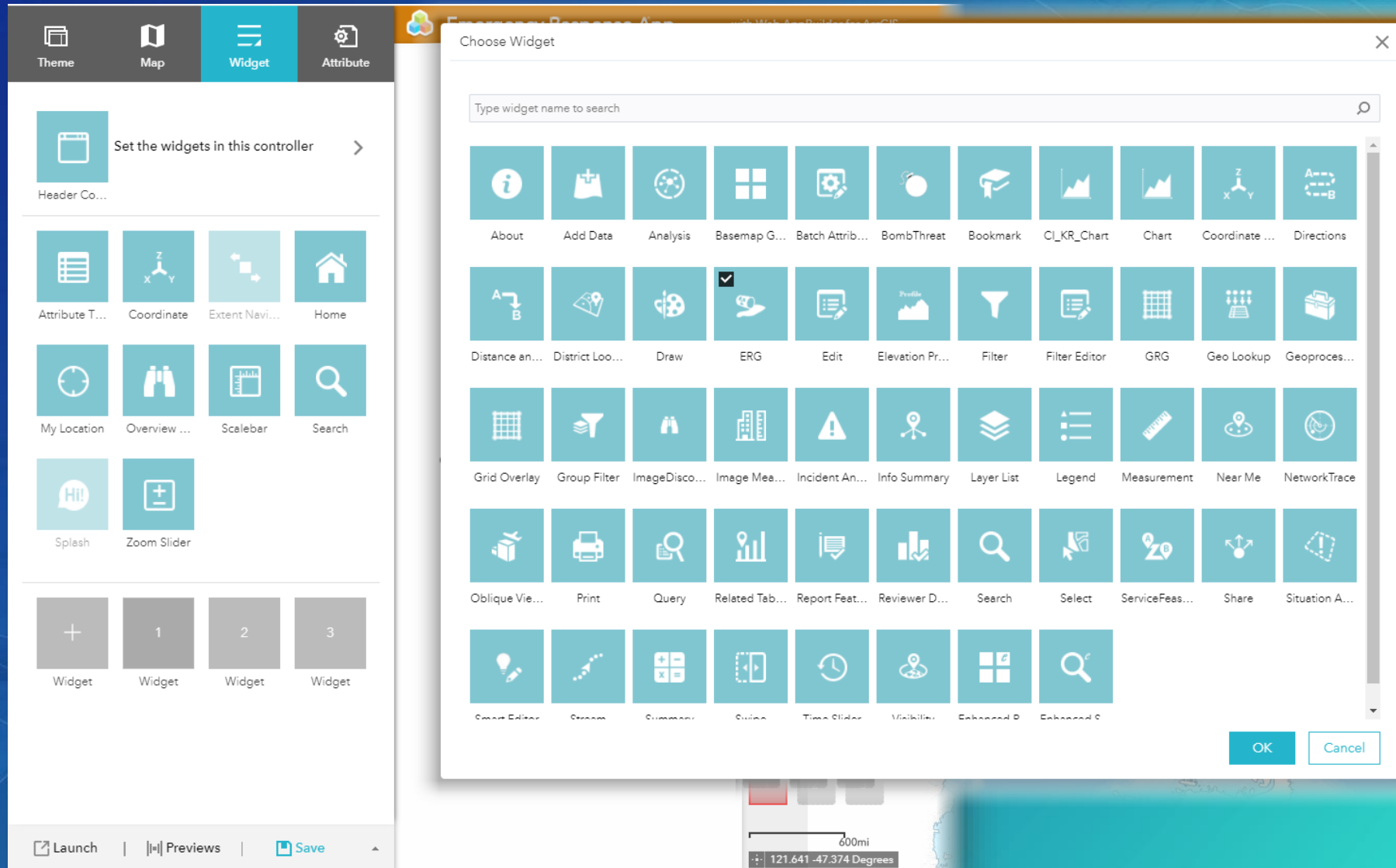
# Configuring the App

## Select Widgets



# Configuring the App

## Select Widgets



# Configuring the App

## Configure the ERG Widget

The screenshot displays the 'Emergency Response App' configuration interface. The top navigation bar includes 'Theme', 'Map', 'Widget' (selected), and 'Attribute'. The 'Widget' tab shows a grid of widget options: 'Header Co...', 'Attribute T...', 'Coordinate', 'Extent Navi...', 'Home', 'My Location', 'Overview ...', 'Scalebar', 'Search', 'Splash', and 'Zoom Slider'. Below these are four 'Widget' buttons labeled 1, 2, and 3. The 'Configure ERG' dialog is open, showing the 'ERG' widget icon and a 'change widget icon' button. The dialog is divided into three sections: 'Geoprocessing Services Parameters', 'Wind Direction Parameters', and 'Facilities Layer Parameters'. Each section contains input fields for service URLs and field names, with expand/collapse icons (+/-) for the latter.

**Configure ERG**

ERG

change widget icon

**Geoprocessing Services Parameters**

Chemical GP Service	<input type="text" value="http://arcgis-emergencymanagement-2057568539.us-east-1.elb.amazonaws.com/arcgis/rest/servi"/>
Placard GP Service	<input type="text" value="http://arcgis-emergencymanagement-2057568539.us-east-1.elb.amazonaws.com/arcgis/rest/servi"/>
Weather Station GP Service	<input type="text" value="http://arcgis-emergencymanagement-2057568539.us-east-1.elb.amazonaws.com/arcgis/rest/servi"/>

**Wind Direction Parameters**

Wind Direction Layer	<input type="text" value="http://arcgis-emergencymanagement-2057568539.us-east-1.elb.amazonaws.com/arcgis/rest/servi"/>
Wind Direction Field Name	<input type="text" value="WindDirection"/> +
Station Field Name	<input type="text" value="StationName"/> +
Date Time Field Name	<input type="text" value="UTC_DateTime"/> +

**Facilities Layer Parameters**

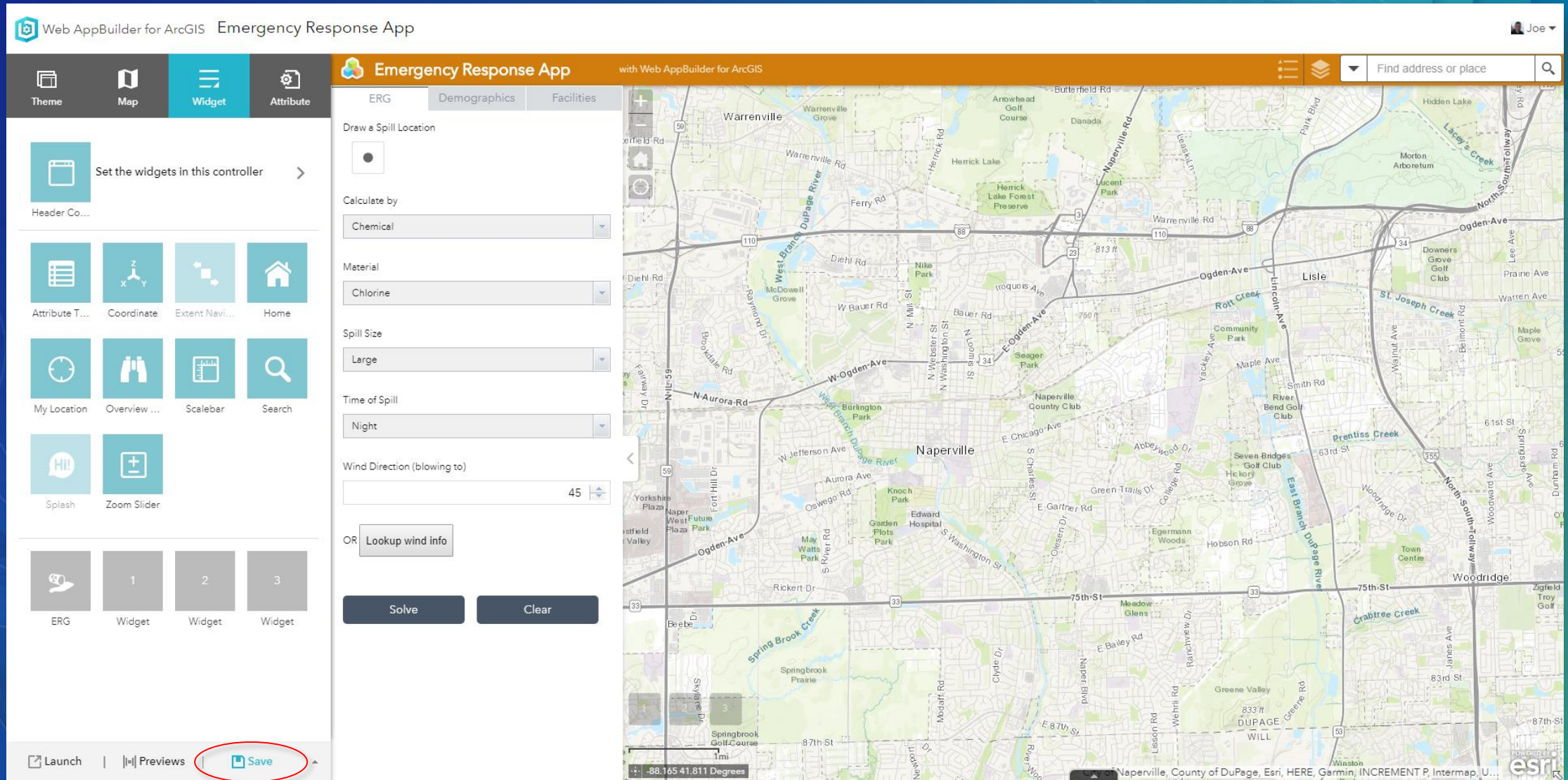
Facilities Map Service	<input type="text" value="http://arcgis-emergencymanagement-2057568539.us-east-1.elb.amazonaws.com/arcgis/rest/servi"/>
Fields	<input type="text" value="NAME,FEATURECODE,STATE"/> +
Label Field	<input type="text" value="NAME"/> +

OK Cancel

Launch | Previews | Save



## Configure the ERG Widget





# Using the App

## Open the ERG Widget

**Emergency Response App** with Web AppBuilder for ArcGIS

ERG Demographics Facilities

Draw a Spill Location

Calculate by

Material

Spill Size

Time of Spill

Wind Direction (blowing to)

OR

Warrenville Naperville Lisle Woodridge

Spring Brook Creek DuPage River

88.165 41.811 Degrees

Naperville, County of DuPage, Esri, HERE, Garmin, INCREMENT P, Intermap, U...



# Using the App

## Identify a search group

**Emergency Response App** with Web AppBuilder for ArcGIS

ERG Demographics Facilities

Draw a Spill Location

Calculate by

Chemical

**Chemical**

Placard

Chlorine

Spill Size

Large

Time of Spill

Night

Wind Direction (blowing to)

45

OR Lookup wind info

Solve Clear

Warrenville Naperville Woodridge

Spring Brook Creek

Springbrook Golf Course

87th St

1mi

-88.207 41.812 Degrees

Naperville, County of DuPage, Esri, HERE, Garmin, INCREMENT P, Intermap, U...

esri



# Using the App

## Choose a material

**Emergency Response App** with Web AppBuilder for ArcGIS

ERG Demographics Facilities

Draw a Spill Location

Calculate by

Material

Chlorine

- Calcium dithionite (when spilled in water)
- Calcium hydrosulfite (when spilled in water)
- Calcium hydrosulphite (when spilled in water)
- Calcium phosphide (when spilled in water)
- Carbon dioxide and Ethylene oxide mixture, with more than 87% Ethylene oxide
- Carbon monoxide
- Carbon monoxide and Hydrogen mixture, compressed
- Carbon monoxide, compressed
- Carbon monoxide, refrigerated liquid (cryogenic liquid)
- Carbonyl fluoride
- Carbonyl fluoride, compressed
- Carbonyl sulfide
- Carbonyl sulphide

**Chlorine**

- Chlorine dioxide, hydrate, frozen (when spilled in water)
- Chlorine pentafluoride
- Chlorine trifluoride
- Chloroacetaldehyde
- Chloroacetone, stabilized
- Chloroacetonitrile
- Chloroacetyl chloride (when spilled in water)
- Chloroacetyl chloride (when spilled on land)
- Chlorophenyltrichlorosilane (when spilled in water)
- Chloropicrin
- Chloropicrin and Methyl bromide mixture
- Chloropicrin and Methyl chloride mixture
- Chloropicrin mixture, n.o.s.

Warrenville Naperville Lisle Woodridge

Find address or place

esri



# Using the App

## Select the Spill Size

**Emergency Response App** with Web AppBuilder for ArcGIS

ERG Demographics Facilities

Draw a Spill Location

Calculate by

Material

Spill Size

Wind Direction (blowing to)

OR Lookup wind info

Solve Clear

Find address or place

Warrenville Naperville Lisle Woodridge

Spring Brook Creek Crabtree Creek

88.214 41.799 Degrees

Naperville, County of DuPage, Esri, HERE, Garmin, INCREMENT P, Intermap, U...



# Using the App

## Select the time of day

**Emergency Response App** with Web AppBuilder for ArcGIS

ERG Demographics Facilities

Draw a Spill Location

Calculate by

Material

Spill Size

Time of Spill

OR Lookup wind info

Solve Clear

Find address or place

Warrenville Naperville Lisle Woodridge

Spring Brook Creek Crabtree Creek

88.215 41.796 Degrees

Naperville, County of DuPage, Esri, HERE, Garmin, INCREMENT P, Intermap, U...



# Using the App

Identify the wind direction by entering it...

**Emergency Response App** with Web AppBuilder for ArcGIS

ERG Demographics Facilities

Draw a Spill Location

Calculate by

Material

Spill Size

Time of Spill

Wind Direction (blowing to)

45

OR Lookup wind info

Solve Clear

Warrenville Naperville Lisle Woodridge

Spring Brook Creek DuPage River

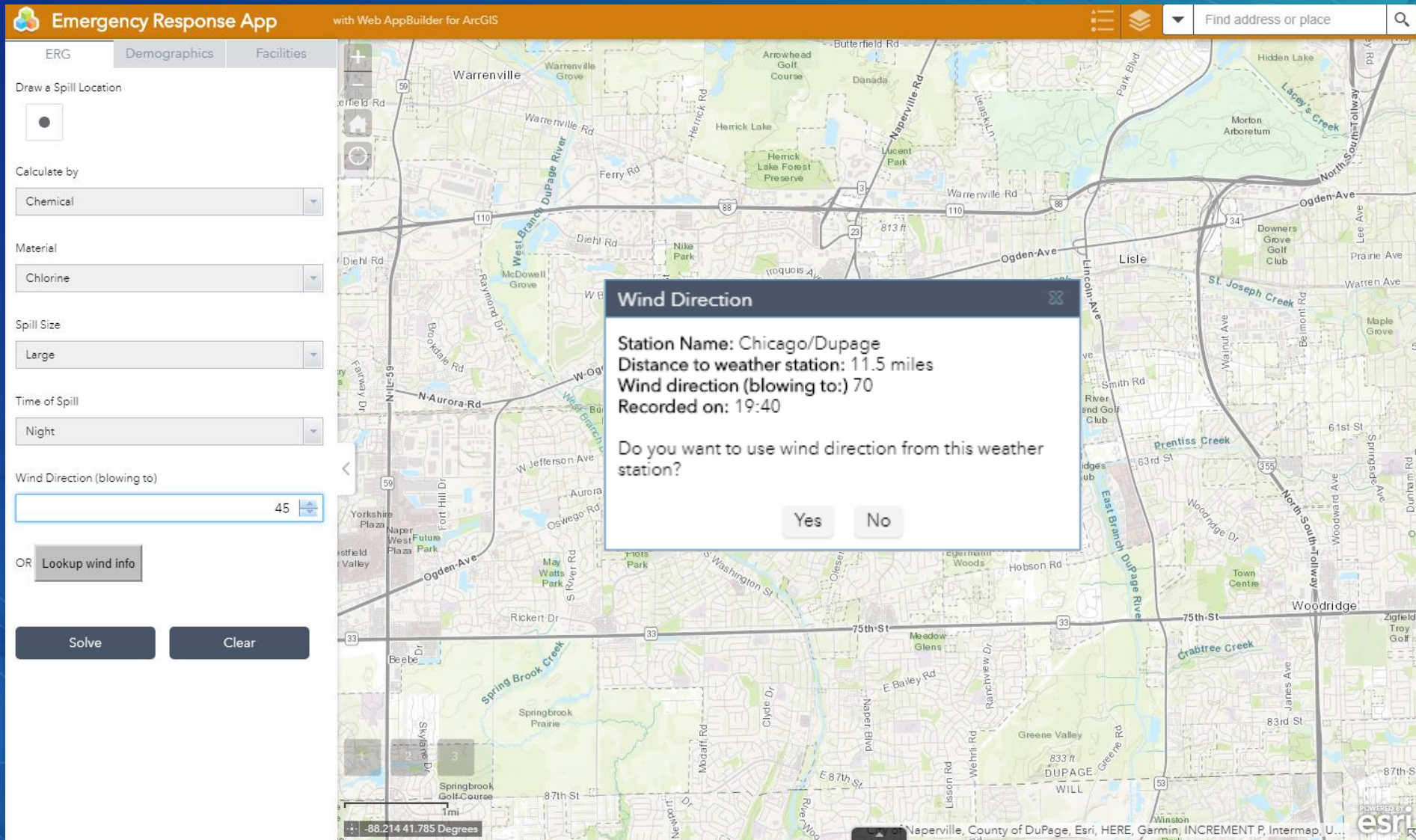
87th St 75th St 63rd St 51st St

88.214 41.785 Degrees

esri



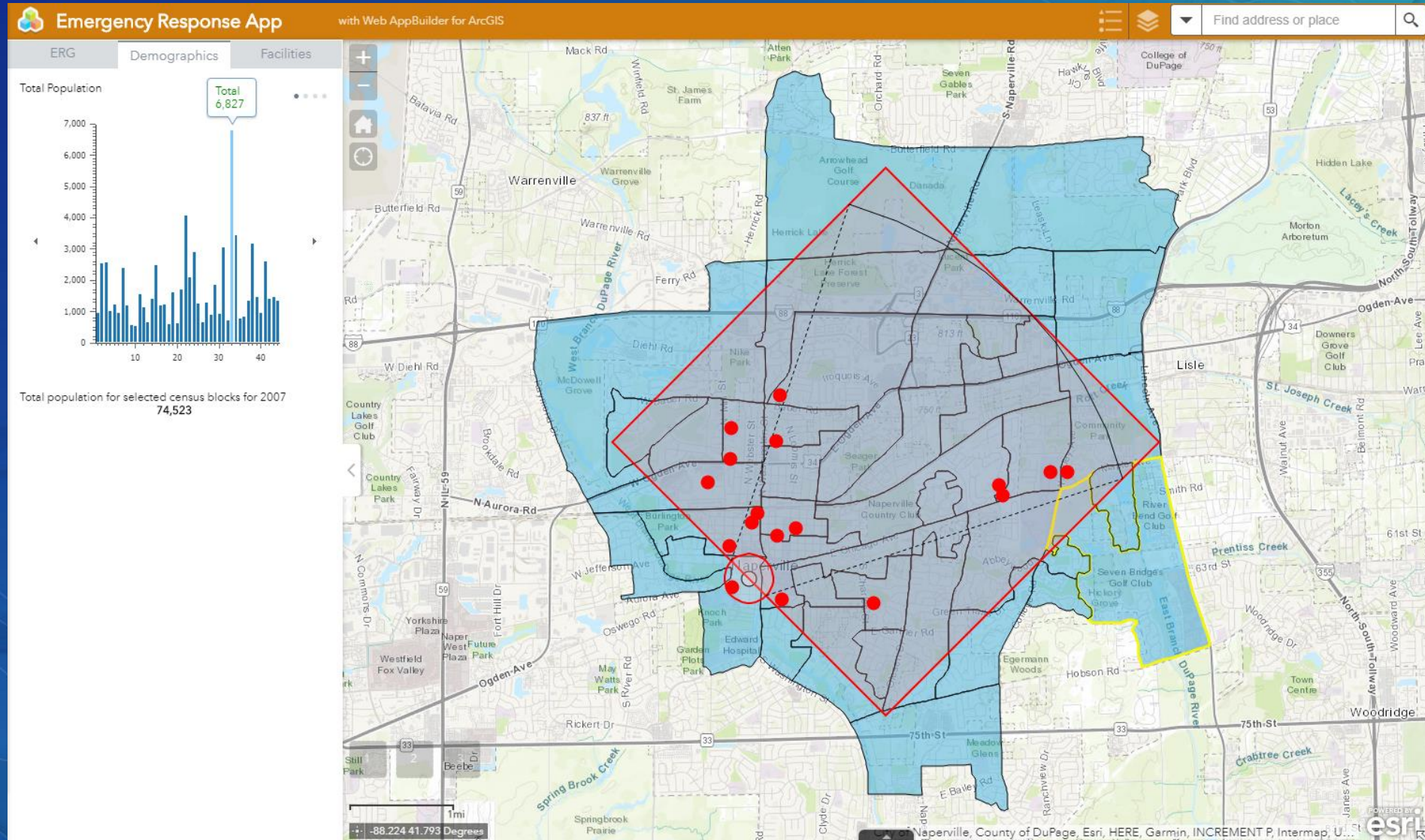
... or looking it up using a service





# Using the App

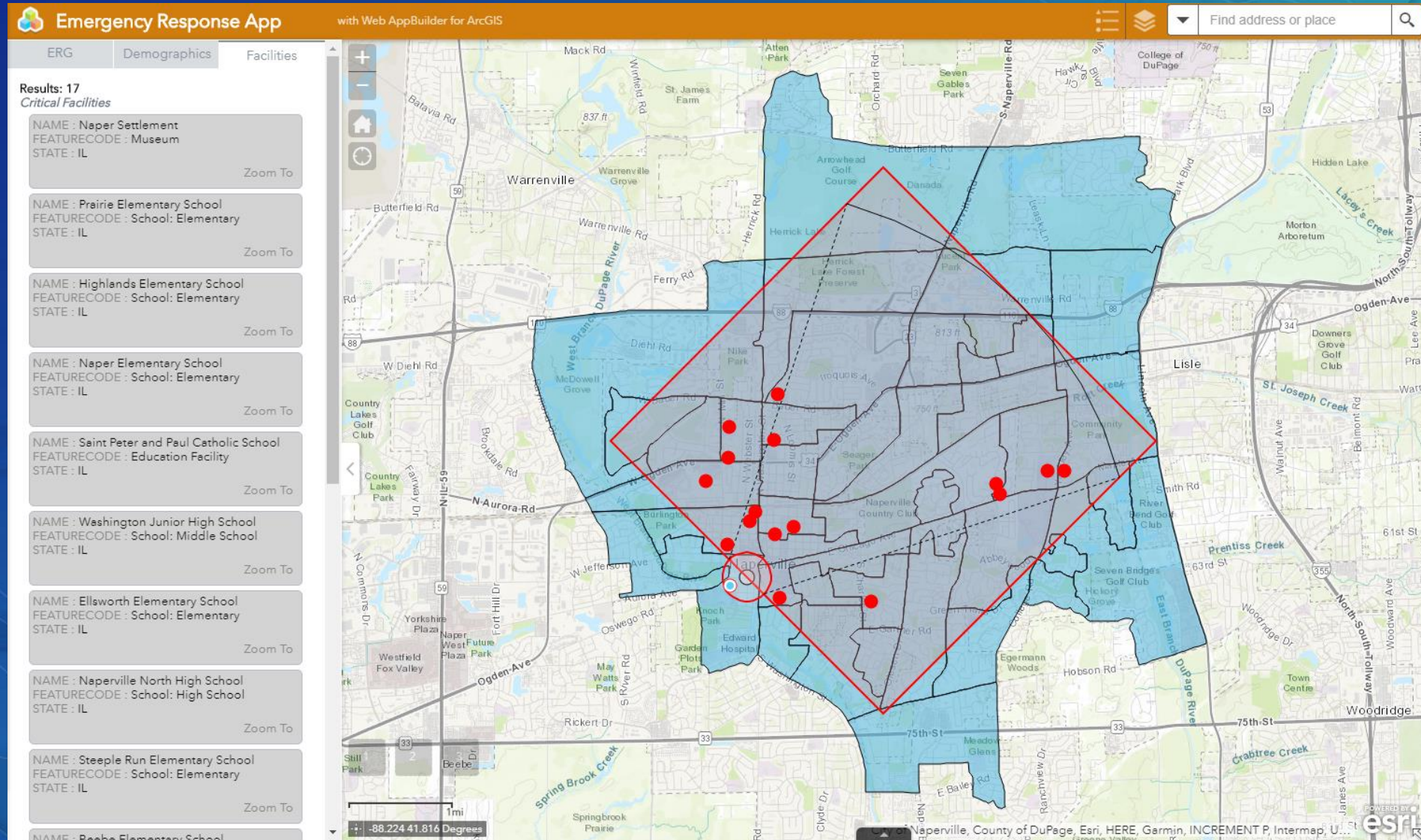
Understanding the demographics of the threatened area





# Using the App

Identifying the critical facilities in threatened area





# Upcoming

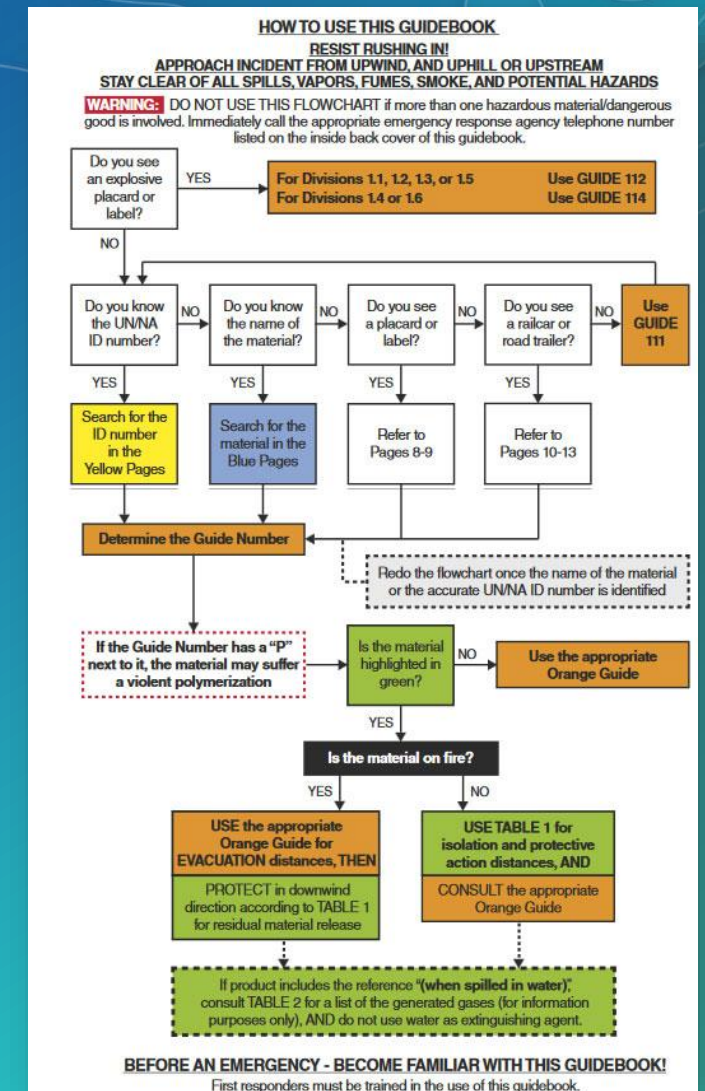
Future plans for the Emergency Response Guide Widget



# Updates

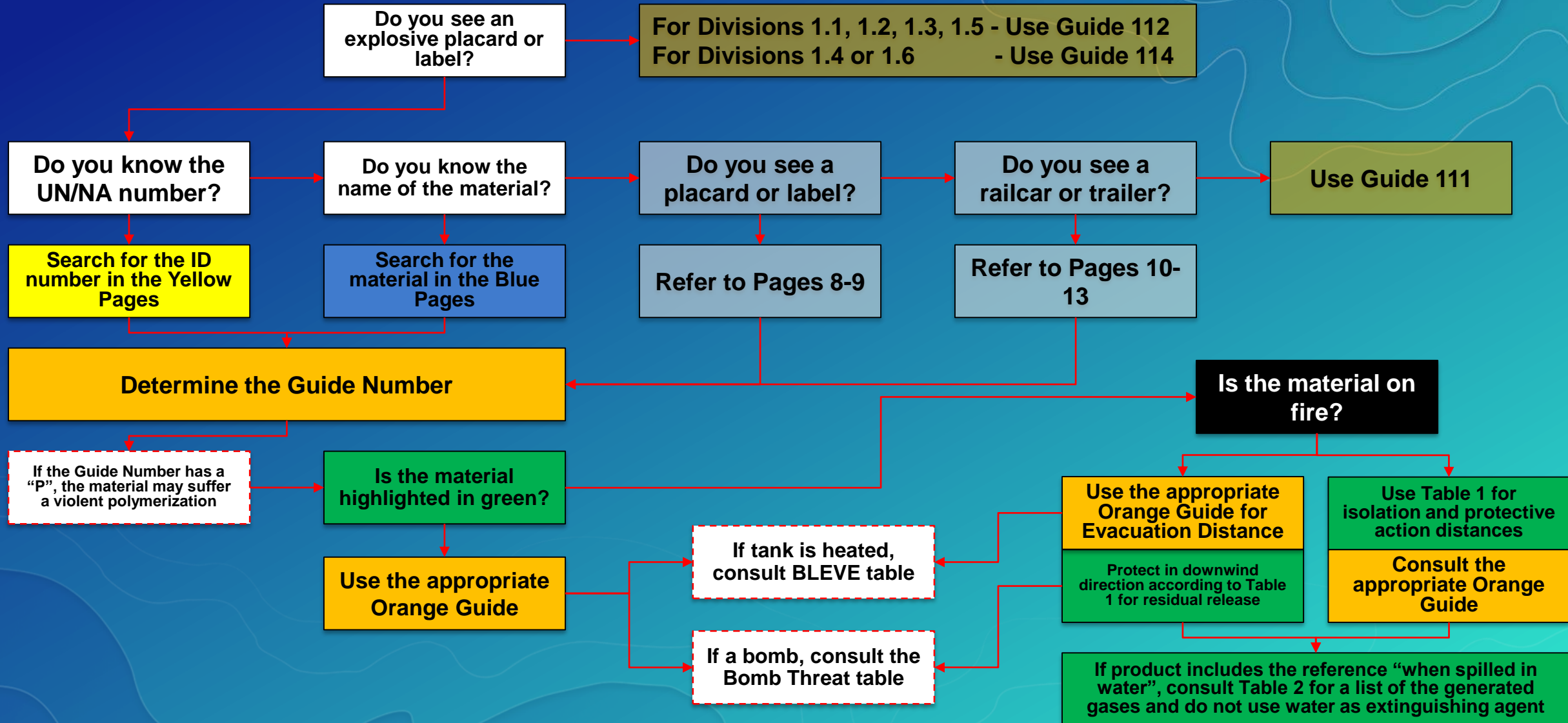
Fall 2017

- Updates to logic
  - New tables
  - New inputs
- Updates to UI
  - Filter and Sort
  - Output to Services
- Enhancements
  - Add Bomb Threat Tables
- Bug Fixes
- ... and more?





# ERG Widget 2.x Workflow



# References

- ArcGIS Solutions Website  
<http://solutions.arcgis.com/>
- GitHub  
<https://github.com/Esri/solutions-webappbuilder-widgets>
- Pipeline and Hazardous Materials Safety Administration (US Department of Transportation)  
<https://www.phmsa.dot.gov/hazmat/outreach-training/erg>





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THE  
SCIENCE  
OF  
WHERE