

# SAFETY DATA SHEET



QuikChange Lightning Site-Directed Mutagenesis Kit, Part Number 210518

## Section 1. Identification

### 1.1 Product identifier

**Product name** : QuikChange Lightning Site-Directed Mutagenesis Kit, Part Number 210518  
**Part no. (chemical kit)** : 210518  
**Part no.** : QuikSolution 200516-51  
 QuikChange Lightning Enzyme 210518-51  
 10X QuikChange Lightning Buffer 210518-53  
 QuikChange XL dNTP Mix 200517-51  
 Dpn I Enzyme 210518-52  
 pWS4.5 Control Template 200518-55  
 Control Primer 1 (34-mer) 200518-53  
 Control Primer 2 (34-mer) 200518-54  
 XL10-Gold Ultracompetent cells 200315-41  
 XL10-Gold 2-Mercaptoethanol 200314-43  
 pUC 18 DNA Control Plasmid 200231-42

**Validation date** : 2/16/2024

### 1.2 Relevant identified uses of the substance or mixture and uses advised against

**Identified uses** :  Analytical reagent.  
 QuikSolution 500 µl  
 QuikChange Lightning Enzyme 10 µl (10 reactions)  
 10X QuikChange Lightning Buffer 500 µl  
 QuikChange XL dNTP Mix 10 µl  
 Dpn I Enzyme 20 µl (10 reactions)  
 pWS4.5 Control Template 50 ng (5 ng/ µl)  
 Control Primer 1 (34-mer) 750 ng (100 ng/ µl)  
 Control Primer 2 (34-mer) 750 ng (100 ng/ µl)  
 XL10-Gold Ultracompetent cells 500 µl  
 XL10-Gold 2-Mercaptoethanol 50 µl  
 pUC 18 DNA Control Plasmid 10 µl (0.1 ng/ µl)

### 1.3 Details of the supplier of the safety data sheet

**Supplier/Manufacturer** : Agilent Technologies, Inc.  
 5301 Stevens Creek Blvd  
 Santa Clara, CA 95051, USA  
 800-227-9770

### 1.4 Emergency telephone number

**In case of emergency** : CHEMTREC®: 1-800-424-9300

## Section 2. Hazards identification

### 2.1 Classification of the substance or mixture

**OSHA/HCS status** : QuikSolution This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).  
 QuikChange Lightning Enzyme This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).  
 10X QuikChange Lightning Buffer While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this SDS contains valuable information critical to the safe handling and proper use of the product. This SDS should be retained and available for employees and other users of this product.

## Section 2. Hazards identification

QuikChange XL dNTP Mix	While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this SDS contains valuable information critical to the safe handling and proper use of the product. This SDS should be retained and available for employees and other users of this product.
Dpn I Enzyme	This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
pWS4.5 Control Template	While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this SDS contains valuable information critical to the safe handling and proper use of the product. This SDS should be retained and available for employees and other users of this product.
Control Primer 1 (34-mer)	While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this SDS contains valuable information critical to the safe handling and proper use of the product. This SDS should be retained and available for employees and other users of this product.
Control Primer 2 (34-mer)	While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this SDS contains valuable information critical to the safe handling and proper use of the product. This SDS should be retained and available for employees and other users of this product.
XL10-Gold Ultracompetent cells	This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
XL10-Gold	This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
2-Mercaptoethanol	This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
pUC 18 DNA Control Plasmid	While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this SDS contains valuable information critical to the safe handling and proper use of the product. This SDS should be retained and available for employees and other users of this product.

### Classification of the substance or mixture

#### **QuikSolution**

H227 FLAMMABLE LIQUIDS - Category 4  
 H320 EYE IRRITATION - Category 2B

#### **QuikChange Lightning Enzyme**

H320 EYE IRRITATION - Category 2B

#### **Dpn I Enzyme**

H320 EYE IRRITATION - Category 2B

#### **XL10-Gold Ultracompetent cells**

H320 EYE IRRITATION - Category 2B

#### **XL10-Gold 2-Mercaptoethanol**

H318 SERIOUS EYE DAMAGE - Category 1  
 H317 SKIN SENSITIZATION - Category 1  
 H361 TOXIC TO REPRODUCTION - Category 2  
 H373 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2  
 H412 AQUATIC HAZARD (LONG-TERM) - Category 3

## Section 2. Hazards identification

10X QuikChange Lightning Buffer	Percentage of the mixture consisting of ingredient (s) of unknown hazards to the aquatic environment: 2%
QuikChange XL dNTP Mix	Percentage of the mixture consisting of ingredient (s) of unknown hazards to the aquatic environment: 5.7%
XL10-Gold Ultracompetent cells	Percentage of the mixture consisting of ingredient (s) of unknown hazards to the aquatic environment: 5%

### 2.2 GHS label elements

#### Hazard pictograms

: XL10-Gold 2-Mercaptoethanol



#### Signal word

: QuikSolution Warning  
 QuikChange Lightning Enzyme Warning  
 10X QuikChange Lightning Buffer No signal word.  
 QuikChange XL dNTP Mix No signal word.  
 Dpn I Enzyme Warning  
 pWS4.5 Control Template No signal word.  
 Control Primer 1 (34-mer) No signal word.  
 Control Primer 2 (34-mer) No signal word.  
 XL10-Gold Ultracompetent cells Warning  
 XL10-Gold 2-Mercaptoethanol Danger  
 pUC 18 DNA Control Plasmid No signal word.

#### Hazard statements

: QuikSolution H227 - Combustible liquid.  
 H320 - Causes eye irritation.  
 QuikChange Lightning Enzyme H320 - Causes eye irritation.  
 10X QuikChange Lightning Buffer No known significant effects or critical hazards.  
 QuikChange XL dNTP Mix No known significant effects or critical hazards.  
 Dpn I Enzyme H320 - Causes eye irritation.  
 pWS4.5 Control Template No known significant effects or critical hazards.  
 Control Primer 1 (34-mer) No known significant effects or critical hazards.  
 Control Primer 2 (34-mer) No known significant effects or critical hazards.  
 XL10-Gold Ultracompetent cells H320 - Causes eye irritation.  
 XL10-Gold 2-Mercaptoethanol H317 - May cause an allergic skin reaction.  
 H318 - Causes serious eye damage.  
 H361 - Suspected of damaging fertility or the unborn child.  
 H373 - May cause damage to organs through prolonged or repeated exposure.  
 H412 - Harmful to aquatic life with long lasting effects.  
 pUC 18 DNA Control Plasmid No known significant effects or critical hazards.

#### Precautionary statements

##### Prevention

: QuikSolution P210 - Keep away from flames and hot surfaces.  
 No smoking.  
 QuikChange Lightning Enzyme Not applicable.  
 10X QuikChange Lightning Buffer Not applicable.  
 QuikChange XL dNTP Mix Not applicable.  
 Dpn I Enzyme Not applicable.  
 pWS4.5 Control Template Not applicable.  
 Control Primer 1 (34-mer) Not applicable.  
 Control Primer 2 (34-mer) Not applicable.  
 XL10-Gold Ultracompetent cells Not applicable.  
 XL10-Gold 2-Mercaptoethanol P201 - Obtain special instructions before use.

## Section 2. Hazards identification

### Response

pUC 18 DNA Control Plasmid  
: QuikSolution

P280 - Wear protective gloves, protective clothing and eye or face protection.  
P273 - Avoid release to the environment.  
P260 - Do not breathe vapor.  
Not applicable.

QuikChange Lightning Enzyme

P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P337 + P313 - If eye irritation persists: Get medical advice or attention.

P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P337 + P313 - If eye irritation persists: Get medical advice or attention.

10X QuikChange Lightning Buffer  
QuikChange XL dNTP Mix  
Dpn I Enzyme

Not applicable.

Not applicable.

P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P337 + P313 - If eye irritation persists: Get medical advice or attention.

pWS4.5 Control Template  
Control Primer 1 (34-mer)  
Control Primer 2 (34-mer)  
XL10-Gold Ultracompetent cells

Not applicable.

Not applicable.

Not applicable.

P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P337 + P313 - If eye irritation persists: Get medical advice or attention.

XL10-Gold 2-Mercaptoethanol

P308 + P313 - IF exposed or concerned: Get medical advice or attention.

P363 - Wash contaminated clothing before reuse.  
P302 + P352 - IF ON SKIN: Wash with plenty of water.

P333 + P313 - If skin irritation or rash occurs: Get medical advice or attention.

P305 + P351 + P338, P310 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor.

### Storage

pUC 18 DNA Control Plasmid  
: QuikSolution

Not applicable.

P403 + P235 - Store in a well-ventilated place. Keep cool.

QuikChange Lightning Enzyme  
10X QuikChange Lightning Buffer  
QuikChange XL dNTP Mix  
Dpn I Enzyme  
pWS4.5 Control Template  
Control Primer 1 (34-mer)  
Control Primer 2 (34-mer)  
XL10-Gold Ultracompetent cells  
XL10-Gold 2-Mercaptoethanol  
pUC 18 DNA Control Plasmid

Not applicable.

Not applicable.

Not applicable.

Not applicable.

Not applicable.

Not applicable.

Not applicable.

Not applicable.

Not applicable.

Not applicable.

## Section 2. Hazards identification

<b>Disposal</b>	: QuikSolution	P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.
	QuikChange Lightning Enzyme	Not applicable.
	10X QuikChange Lightning Buffer	Not applicable.
	QuikChange XL dNTP Mix	Not applicable.
	Dpn I Enzyme	Not applicable.
	pWS4.5 Control Template	Not applicable.
	Control Primer 1 (34-mer)	Not applicable.
	Control Primer 2 (34-mer)	Not applicable.
	XL10-Gold Ultracompetent cells	Not applicable.
	XL10-Gold 2-Mercaptoethanol	P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.
	pUC 18 DNA Control Plasmid	Not applicable.
<b>Supplemental label elements</b>	: QuikSolution	None known.
	QuikChange Lightning Enzyme	None known.
	10X QuikChange Lightning Buffer	None known.
	QuikChange XL dNTP Mix	None known.
	Dpn I Enzyme	None known.
	pWS4.5 Control Template	None known.
	Control Primer 1 (34-mer)	None known.
	Control Primer 2 (34-mer)	None known.
	XL10-Gold Ultracompetent cells	None known.
	XL10-Gold 2-Mercaptoethanol	None known.
	pUC 18 DNA Control Plasmid	None known.
<b>2.3 Other hazards</b>		
<b>Hazards not otherwise classified</b>	: QuikSolution	None known.
	QuikChange Lightning Enzyme	None known.
	10X QuikChange Lightning Buffer	None known.
	QuikChange XL dNTP Mix	None known.
	Dpn I Enzyme	None known.
	pWS4.5 Control Template	None known.
	Control Primer 1 (34-mer)	None known.
	Control Primer 2 (34-mer)	None known.
	XL10-Gold Ultracompetent cells	None known.
	XL10-Gold 2-Mercaptoethanol	None known.
	pUC 18 DNA Control Plasmid	None known.

## Section 3. Composition/information on ingredients

<b>Substance/mixture</b>	: QuikSolution	Substance
	QuikChange Lightning Enzyme	Mixture
	10X QuikChange Lightning Buffer	Mixture
	QuikChange XL dNTP Mix	Mixture
	Dpn I Enzyme	Mixture
	pWS4.5 Control Template	Mixture
	Control Primer 1 (34-mer)	Mixture
	Control Primer 2 (34-mer)	Mixture
	XL10-Gold Ultracompetent cells	Mixture
	XL10-Gold 2-Mercaptoethanol	Mixture
	pUC 18 DNA Control Plasmid	Mixture

## Section 3. Composition/information on ingredients

Ingredient name	%	CAS number
<b>QuikSolution</b>		
Dimethyl sulfoxide	100	67-68-5
<b>QuikChange Lightning Enzyme</b>		
Glycerol	≥50 - ≤75	56-81-5
<b>10X QuikChange Lightning Buffer</b>		
Potassium chloride	≤5	7447-40-7
Dodecyldimethyl(3-sulphonatopropyl)ammonium	≤3	14933-08-5
<b>Dpn I Enzyme</b>		
Glycerol	≥50 - ≤75	56-81-5
<b>XL10-Gold Ultracompetent cells</b>		
Glycerol	≥10 - ≤25	56-81-5
Dimethyl sulfoxide	≤10	67-68-5
Potassium chloride	≤3	7447-40-7
<b>XL10-Gold 2-Mercaptoethanol</b>		
2-Mercaptoethanol	≤5	60-24-2

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

**There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified and hence require reporting in this section.**

Occupational exposure limits, if available, are listed in Section 8.

## Section 4. First aid measures

### 4.1 Description of necessary first aid measures

<b>Eye contact</b>	: QuikSolution	Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. If irritation persists, get medical attention.
	QuikChange Lightning Enzyme	Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. If irritation persists, get medical attention.
	10X QuikChange Lightning Buffer	Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention if irritation occurs.
	QuikChange XL dNTP Mix	Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids.

## Section 4. First aid measures

		<p>Check for and remove any contact lenses. Get medical attention if irritation occurs.</p>
	Dpn I Enzyme	<p>Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. If irritation persists, get medical attention.</p>
	pWS4.5 Control Template	<p>Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention if irritation occurs.</p>
	Control Primer 1 (34-mer)	<p>Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention if irritation occurs.</p>
	Control Primer 2 (34-mer)	<p>Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention if irritation occurs.</p>
	XL10-Gold Ultracompetent cells	<p>Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. If irritation persists, get medical attention.</p>
	XL10-Gold 2-Mercaptoethanol	<p>Get medical attention immediately. Call a poison center or physician. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician.</p>
	pUC 18 DNA Control Plasmid	<p>Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention if irritation occurs.</p>
<p><b>Inhalation</b></p>	<p>: QuikSolution</p>	<p>Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.</p>
	QuikChange Lightning Enzyme	<p>Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.</p>
	10X QuikChange Lightning Buffer	<p>Remove victim to fresh air and keep at rest in a</p>

## Section 4. First aid measures

	position comfortable for breathing. Get medical attention if symptoms occur. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
QuikChange XL dNTP Mix	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
Dpn I Enzyme	Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
pWS4.5 Control Template	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.
Control Primer 1 (34-mer)	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.
Control Primer 2 (34-mer)	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.
XL10-Gold Ultracompetent cells	Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
XL10-Gold 2-Mercaptoethanol	Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie,



## Section 4. First aid measures

### Skin contact

pUC 18 DNA Control Plasmid		belt or waistband. Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.
: QuikSolution		Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.
QuikChange Lightning Enzyme		Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.
10X QuikChange Lightning Buffer		Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
QuikChange XL dNTP Mix		Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
Dpn I Enzyme		Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.
pWS4.5 Control Template		Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
Control Primer 1 (34-mer)		Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
Control Primer 2 (34-mer)		Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
XL10-Gold Ultracompetent cells		Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.
XL10-Gold 2-Mercaptoethanol		Get medical attention immediately. Call a poison center or physician. Wash with plenty of soap and water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse.
pUC 18 DNA Control Plasmid		Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.

### Ingestion

: QuikSolution		Wash out mouth with water. Remove dentures if any. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs.
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## Section 4. First aid measures

QuikChange Lightning Enzyme

Get medical attention if adverse health effects persist or are severe. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. Wash out mouth with water. Remove dentures if any. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs.

10X QuikChange Lightning Buffer

Get medical attention if adverse health effects persist or are severe. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. Wash out mouth with water. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.

QuikChange XL dNTP Mix

Wash out mouth with water. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.

Dpn I Enzyme

Wash out mouth with water. Remove dentures if any. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs.

pWS4.5 Control Template

Get medical attention if adverse health effects persist or are severe. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. Wash out mouth with water. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.

Control Primer 1 (34-mer)

Wash out mouth with water. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.

Control Primer 2 (34-mer)

Wash out mouth with water. If material has been swallowed and the exposed person is conscious,

## Section 4. First aid measures

XL10-Gold Ultracompetent cells

give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.

Wash out mouth with water. Remove dentures if any. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs.

Get medical attention if adverse health effects persist or are severe. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

XL10-Gold 2-Mercaptoethanol

Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs.

Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. Wash out mouth with water. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.


pUC 18 DNA Control Plasmid

Wash out mouth with water. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.

### 4.2 Most important symptoms/effects, acute and delayed

#### Potential acute health effects

##### Eye contact

:  QuikSolution  
 QuikChange Lightning Enzyme  
 10X QuikChange Lightning Buffer  
 QuikChange XL dNTP Mix  
 Dpn I Enzyme  
 pWS4.5 Control Template  
 Control Primer 1 (34-mer)  
 Control Primer 2 (34-mer)  
 XL10-Gold Ultracompetent cells  
 XL10-Gold 2-Mercaptoethanol  
 pUC 18 DNA Control Plasmid

Causes eye irritation.

Causes eye irritation.

No known significant effects or critical hazards.

No known significant effects or critical hazards.

Causes eye irritation.

No known significant effects or critical hazards.

No known significant effects or critical hazards.

No known significant effects or critical hazards.

Causes eye irritation.

Causes serious eye damage.

No known significant effects or critical hazards.

## Section 4. First aid measures

<b>Inhalation</b>	: QuikSolution QuikChange Lightning Enzyme 10X QuikChange Lightning Buffer QuikChange XL dNTP Mix Dpn I Enzyme pWS4.5 Control Template Control Primer 1 (34-mer) Control Primer 2 (34-mer) XL10-Gold Ultracompetent cells XL10-Gold 2-Mercaptoethanol pUC 18 DNA Control Plasmid	No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards.
<b>Skin contact</b>	: QuikSolution QuikChange Lightning Enzyme 10X QuikChange Lightning Buffer QuikChange XL dNTP Mix Dpn I Enzyme pWS4.5 Control Template Control Primer 1 (34-mer) Control Primer 2 (34-mer) XL10-Gold Ultracompetent cells XL10-Gold 2-Mercaptoethanol pUC 18 DNA Control Plasmid	No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. May cause an allergic skin reaction. No known significant effects or critical hazards.
<b>Ingestion</b>	: QuikSolution QuikChange Lightning Enzyme 10X QuikChange Lightning Buffer QuikChange XL dNTP Mix Dpn I Enzyme pWS4.5 Control Template Control Primer 1 (34-mer) Control Primer 2 (34-mer) XL10-Gold Ultracompetent cells XL10-Gold 2-Mercaptoethanol pUC 18 DNA Control Plasmid	No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards.

### Over-exposure signs/symptoms

<b>Eye contact</b>	: <input checked="" type="checkbox"/> QuikSolution	Adverse symptoms may include the following: irritation watering redness
	QuikChange Lightning Enzyme	Adverse symptoms may include the following: irritation watering redness
	10X QuikChange Lightning Buffer QuikChange XL dNTP Mix Dpn I Enzyme	No specific data. No specific data. Adverse symptoms may include the following: irritation watering redness
	pWS4.5 Control Template Control Primer 1 (34-mer) Control Primer 2 (34-mer) XL10-Gold Ultracompetent cells	No specific data. No specific data. No specific data. Adverse symptoms may include the following: irritation watering redness
	XL10-Gold 2-Mercaptoethanol	Adverse symptoms may include the following: pain watering redness

## Section 4. First aid measures

**Inhalation**

pUC 18 DNA Control Plasmid No specific data.

: QuikSolution No specific data.

QuikChange Lightning Enzyme No specific data.

10X QuikChange Lightning Buffer No specific data.

QuikChange XL dNTP Mix No specific data.

Dpn I Enzyme No specific data.

pWS4.5 Control Template No specific data.

Control Primer 1 (34-mer) No specific data.

Control Primer 2 (34-mer) No specific data.

XL10-Gold Ultracompetent cells No specific data.

XL10-Gold 2-Mercaptoethanol Adverse symptoms may include the following:

reduced fetal weight  
increase in fetal deaths  
skeletal malformations

**Skin contact**

pUC 18 DNA Control Plasmid No specific data.

: QuikSolution No specific data.

QuikChange Lightning Enzyme No specific data.

10X QuikChange Lightning Buffer No specific data.

QuikChange XL dNTP Mix No specific data.

Dpn I Enzyme No specific data.

pWS4.5 Control Template No specific data.

Control Primer 1 (34-mer) No specific data.

Control Primer 2 (34-mer) No specific data.

XL10-Gold Ultracompetent cells No specific data.

XL10-Gold 2-Mercaptoethanol Adverse symptoms may include the following:

pain or irritation  
redness  
blistering may occur  
reduced fetal weight  
increase in fetal deaths  
skeletal malformations

**Ingestion**

pUC 18 DNA Control Plasmid No specific data.

: QuikSolution No specific data.

QuikChange Lightning Enzyme No specific data.

10X QuikChange Lightning Buffer No specific data.

QuikChange XL dNTP Mix No specific data.

Dpn I Enzyme No specific data.

pWS4.5 Control Template No specific data.

Control Primer 1 (34-mer) No specific data.

Control Primer 2 (34-mer) No specific data.

XL10-Gold Ultracompetent cells No specific data.

XL10-Gold 2-Mercaptoethanol Adverse symptoms may include the following:

stomach pains  
reduced fetal weight  
increase in fetal deaths  
skeletal malformations

pUC 18 DNA Control Plasmid No specific data.

### 4.3 Indication of immediate medical attention and special treatment needed, if necessary

**Notes to physician**

: QuikSolution Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

QuikChange Lightning Enzyme Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

10X QuikChange Lightning Buffer In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical

## Section 4. First aid measures

QuikChange XL dNTP Mix	surveillance for 48 hours. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
Dpn I Enzyme	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
pWS4.5 Control Template	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
Control Primer 1 (34-mer)	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
Control Primer 2 (34-mer)	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
XL10-Gold Ultracompetent cells	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
XL10-Gold 2-Mercaptoethanol	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
pUC 18 DNA Control Plasmid	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
<b>Specific treatments</b>	<p>: QuikSolution No specific treatment.</p> <p>QuikChange Lightning Enzyme No specific treatment.</p> <p>10X QuikChange Lightning Buffer No specific treatment.</p> <p>QuikChange XL dNTP Mix No specific treatment.</p> <p>Dpn I Enzyme No specific treatment.</p> <p>pWS4.5 Control Template No specific treatment.</p> <p>Control Primer 1 (34-mer) No specific treatment.</p> <p>Control Primer 2 (34-mer) No specific treatment.</p> <p>XL10-Gold Ultracompetent cells No specific treatment.</p> <p>XL10-Gold 2-Mercaptoethanol No specific treatment.</p> <p>pUC 18 DNA Control Plasmid No specific treatment.</p>
<b>Protection of first-aiders</b>	<p>: QuikSolution No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.</p> <p>QuikChange Lightning Enzyme No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.</p> <p>10X QuikChange Lightning Buffer No action shall be taken involving any personal risk or without suitable training.</p> <p>QuikChange XL dNTP Mix No action shall be taken involving any personal risk or without suitable training.</p> <p>Dpn I Enzyme No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.</p> <p>pWS4.5 Control Template No action shall be taken involving any personal risk or without suitable training.</p> <p>Control Primer 1 (34-mer) No action shall be taken involving any personal risk or without suitable training.</p> <p>Control Primer 2 (34-mer) No action shall be taken involving any personal risk or without suitable training.</p>

## Section 4. First aid measures

XL10-Gold Ultracompetent cells	No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.
XL10-Gold 2-Mercaptoethanol	No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.
pUC 18 DNA Control Plasmid	No action shall be taken involving any personal risk or without suitable training.

See toxicological information (Section 11)

## Section 5. Fire-fighting measures

### 5.1 Extinguishing media

<b>Suitable extinguishing media</b>	: QuikSolution QuikChange Lightning Enzyme  10X QuikChange Lightning Buffer  QuikChange XL dNTP Mix  Dpn I Enzyme  pWS4.5 Control Template  Control Primer 1 (34-mer)  Control Primer 2 (34-mer)  XL10-Gold Ultracompetent cells  XL10-Gold 2-Mercaptoethanol  pUC 18 DNA Control Plasmid	Use dry chemical, CO <sub>2</sub> , water spray (fog) or foam. Use an extinguishing agent suitable for the surrounding fire. Use an extinguishing agent suitable for the surrounding fire. Use an extinguishing agent suitable for the surrounding fire. Use an extinguishing agent suitable for the surrounding fire. Use an extinguishing agent suitable for the surrounding fire. Use an extinguishing agent suitable for the surrounding fire. Use an extinguishing agent suitable for the surrounding fire. Use an extinguishing agent suitable for the surrounding fire. Use an extinguishing agent suitable for the surrounding fire. Use an extinguishing agent suitable for the surrounding fire. Use an extinguishing agent suitable for the surrounding fire.
<b>Unsuitable extinguishing media</b>	: QuikSolution QuikChange Lightning Enzyme 10X QuikChange Lightning Buffer QuikChange XL dNTP Mix Dpn I Enzyme pWS4.5 Control Template Control Primer 1 (34-mer) Control Primer 2 (34-mer) XL10-Gold Ultracompetent cells XL10-Gold 2-Mercaptoethanol pUC 18 DNA Control Plasmid	Do not use water jet. None known. None known. None known. None known. None known. None known. None known. None known. None known. None known.

### 5.2 Special hazards arising from the substance or mixture

## Section 5. Fire-fighting measures

<b>Specific hazards arising from the chemical</b>	: QuikSolution	Combustible liquid. Runoff to sewer may create fire or explosion hazard. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. The vapor/gas is heavier than air and will spread along the ground. Vapors may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back.
	QuikChange Lightning Enzyme	In a fire or if heated, a pressure increase will occur and the container may burst.
	10X QuikChange Lightning Buffer	In a fire or if heated, a pressure increase will occur and the container may burst.
	QuikChange XL dNTP Mix	In a fire or if heated, a pressure increase will occur and the container may burst.
	Dpn I Enzyme	In a fire or if heated, a pressure increase will occur and the container may burst.
	pWS4.5 Control Template	In a fire or if heated, a pressure increase will occur and the container may burst.
	Control Primer 1 (34-mer)	In a fire or if heated, a pressure increase will occur and the container may burst.
	Control Primer 2 (34-mer)	In a fire or if heated, a pressure increase will occur and the container may burst.
	XL10-Gold Ultracompetent cells	In a fire or if heated, a pressure increase will occur and the container may burst.
	XL10-Gold 2-Mercaptoethanol	In a fire or if heated, a pressure increase will occur and the container may burst. This material is harmful to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.
	pUC 18 DNA Control Plasmid	In a fire or if heated, a pressure increase will occur and the container may burst.
<b>Hazardous thermal decomposition products</b>	: QuikSolution	Decomposition products may include the following materials: carbon dioxide carbon monoxide sulfur oxides
	QuikChange Lightning Enzyme	Decomposition products may include the following materials: carbon dioxide carbon monoxide
	10X QuikChange Lightning Buffer	Decomposition products may include the following materials: carbon dioxide carbon monoxide nitrogen oxides sulfur oxides halogenated compounds metal oxide/oxides
	QuikChange XL dNTP Mix	Decomposition products may include the following materials: carbon dioxide carbon monoxide nitrogen oxides phosphorus oxides
	Dpn I Enzyme	Decomposition products may include the following materials: carbon dioxide carbon monoxide



## Section 5. Fire-fighting measures

pWS4.5 Control Template	halogenated compounds
Control Primer 1 (34-mer)	metal oxide/oxides
Control Primer 2 (34-mer)	No specific data.
XL10-Gold Ultracompetent cells	No specific data.
	No specific data.
	Decomposition products may include the following materials:
	carbon dioxide
	carbon monoxide
	sulfur oxides
	halogenated compounds
	metal oxide/oxides
XL10-Gold 2-Mercaptoethanol	Decomposition products may include the following materials:
	carbon dioxide
	carbon monoxide
	sulfur oxides
	halogenated compounds
	metal oxide/oxides
pUC 18 DNA Control Plasmid	No specific data.

### 5.3 Advice for firefighters

#### Special protective actions for fire-fighters

QuikSolution	Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.
QuikChange Lightning Enzyme	Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.
10X QuikChange Lightning Buffer	Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.
QuikChange XL dNTP Mix	Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.
Dpn I Enzyme	Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.
pWS4.5 Control Template	Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.
Control Primer 1 (34-mer)	Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.
Control Primer 2 (34-mer)	Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.
XL10-Gold Ultracompetent cells	Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or

## Section 5. Fire-fighting measures

**Special protective equipment for fire-fighters**

XL10-Gold 2-Mercaptoethanol		without suitable training. Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.
pUC 18 DNA Control Plasmid		Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.
	: QuikSolution	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
QuikChange Lightning Enzyme		Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
10X QuikChange Lightning Buffer		Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
QuikChange XL dNTP Mix		Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
Dpn I Enzyme		Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
pWS4.5 Control Template		Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
Control Primer 1 (34-mer)		Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
Control Primer 2 (34-mer)		Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
XL10-Gold Ultracompetent cells		Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
XL10-Gold 2-Mercaptoethanol		Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
pUC 18 DNA Control Plasmid		Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

## Section 6. Accidental release measures

### 6.1 Personal precautions, protective equipment and emergency procedures

**For non-emergency personnel**

: QuikSolution

No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

QuikChange Lightning Enzyme

No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

10X QuikChange Lightning Buffer

No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Put on appropriate personal protective equipment.

QuikChange XL dNTP Mix

No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Put on appropriate personal protective equipment.

Dpn I Enzyme

No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

pWS4.5 Control Template

No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Put on appropriate personal protective equipment.

Control Primer 1 (34-mer)

No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Put on appropriate personal protective equipment.

Control Primer 2 (34-mer)

No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Put on appropriate personal protective equipment.

## Section 6. Accidental release measures

XL10-Gold Ultracompetent cells	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
XL10-Gold 2-Mercaptoethanol	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
pUC 18 DNA Control Plasmid	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Put on appropriate personal protective equipment.
<b>For emergency responders :</b> QuikSolution	If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
QuikChange Lightning Enzyme	If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
10X QuikChange Lightning Buffer	If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
QuikChange XL dNTP Mix	If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
Dpn I Enzyme	If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
pWS4.5 Control Template	If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
Control Primer 1 (34-mer)	If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
Control Primer 2 (34-mer)	If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
XL10-Gold Ultracompetent cells	If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

## Section 6. Accidental release measures

	XL10-Gold 2-Mercaptoethanol	If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
	pUC 18 DNA Control Plasmid	If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
<p><b>6.2 Environmental precautions</b></p>	: QuikSolution	Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
	QuikChange Lightning Enzyme	Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
	10X QuikChange Lightning Buffer	Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
	QuikChange XL dNTP Mix	Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
	Dpn I Enzyme	Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
	pWS4.5 Control Template	Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
	Control Primer 1 (34-mer)	Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
	Control Primer 2 (34-mer)	Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
	XL10-Gold Ultracompetent cells	Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
	XL10-Gold 2-Mercaptoethanol	Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in

## Section 6. Accidental release measures

pUC 18 DNA Control Plasmid

large quantities.

Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

### 6.3 Methods and materials for containment and cleaning up

**Methods for cleaning up** : QuikSolution

QuikChange Lightning Enzyme

Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

10X QuikChange Lightning Buffer

Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

QuikChange XL dNTP Mix

Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Dpn I Enzyme

Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

pWS4.5 Control Template

Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Control Primer 1 (34-mer)

Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Control Primer 2 (34-mer)

Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

XL10-Gold Ultracompetent cells

Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble.

## Section 6. Accidental release measures

XL10-Gold 2-Mercaptoethanol	Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor. Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
pUC 18 DNA Control Plasmid	Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

## Section 7. Handling and storage

### 7.1 Precautions for safe handling

**Protective measures** : QuikSolution

QuikChange Lightning Enzyme	Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Empty containers retain product residue and can be hazardous. Do not reuse container.
10X QuikChange Lightning Buffer	Put on appropriate personal protective equipment (see Section 8).
QuikChange XL dNTP Mix	Put on appropriate personal protective equipment (see Section 8).
Dpn I Enzyme	Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.
pWS4.5 Control Template	Put on appropriate personal protective equipment (see Section 8).
Control Primer 1 (34-mer)	Put on appropriate personal protective equipment (see Section 8).

## Section 7. Handling and storage

<p><b>Advice on general occupational hygiene</b></p>	<p>Control Primer 2 (34-mer)</p> <p>XL10-Gold Ultracompetent cells</p> <p>XL10-Gold 2-Mercaptoethanol</p> <p>pUC 18 DNA Control Plasmid</p> <p>: QuikSolution</p> <p>QuikChange Lightning Enzyme</p> <p>10X QuikChange Lightning Buffer</p> <p>QuikChange XL dNTP Mix</p> <p>Dpn I Enzyme</p>	<p>Put on appropriate personal protective equipment (see Section 8).</p> <p>Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.</p> <p>Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Avoid exposure - obtain special instructions before use. Avoid exposure during pregnancy. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Avoid release to the environment. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.</p> <p>Put on appropriate personal protective equipment (see Section 8).</p> <p>Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.</p> <p>Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.</p> <p>Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.</p> <p>Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.</p> <p>Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face</p>
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## Section 7. Handling and storage

pWS4.5 Control Template	before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures. Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.
Control Primer 1 (34-mer)	Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.
Control Primer 2 (34-mer)	Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.
XL10-Gold Ultracompetent cells	Potentially biohazardous material. Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.
XL10-Gold 2-Mercaptoethanol	Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.
pUC 18 DNA Control Plasmid	Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

**7.2 Conditions for safe storage, including any incompatibilities**

: QuikSolution

Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

## Section 7. Handling and storage

QuikChange Lightning Enzyme	<p>See Section 10 for incompatible materials before handling or use.</p> <p>Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.</p>
10X QuikChange Lightning Buffer	<p>Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.</p>
QuikChange XL dNTP Mix	<p>Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.</p>
Dpn I Enzyme	<p>Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.</p>
pWS4.5 Control Template	<p>Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.</p>
Control Primer 1 (34-mer)	<p>Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from</p>

## Section 7. Handling and storage

Control Primer 2 (34-mer)	<p>incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.</p> <p>Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.</p>
XL10-Gold Ultracompetent cells	<p>Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.</p>
XL10-Gold 2-Mercaptoethanol	<p>Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.</p>
pUC 18 DNA Control Plasmid	<p>Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.</p>

### [7.3 Specific end use\(s\)](#)

## Section 7. Handling and storage

<b>Recommendations</b>	: QuikSolution QuikChange Lightning Enzyme 10X QuikChange Lightning Buffer QuikChange XL dNTP Mix Dpn I Enzyme pWS4.5 Control Template Control Primer 1 (34-mer) Control Primer 2 (34-mer) XL10-Gold Ultracompetent cells XL10-Gold 2-Mercaptoethanol pUC 18 DNA Control Plasmid	Industrial applications, Professional applications. Industrial applications, Professional applications. Industrial applications, Professional applications. Industrial applications, Professional applications. Industrial applications, Professional applications. Industrial applications, Professional applications. Industrial applications, Professional applications. Industrial applications, Professional applications. Industrial applications, Professional applications. Industrial applications, Professional applications. Industrial applications, Professional applications.
<b>Industrial sector specific solutions</b>	: QuikSolution QuikChange Lightning Enzyme 10X QuikChange Lightning Buffer QuikChange XL dNTP Mix Dpn I Enzyme pWS4.5 Control Template Control Primer 1 (34-mer) Control Primer 2 (34-mer) XL10-Gold Ultracompetent cells XL10-Gold 2-Mercaptoethanol pUC 18 DNA Control Plasmid	Not available. Not available. Not available. Not available. Not available. Not available. Not available. Not available. Not available. Not available. Not available.

## Section 8. Exposure controls/personal protection

### 8.1 Control parameters

#### Occupational exposure limits

Ingredient name	Exposure limits
<b>QuikSolution</b> Dimethyl sulfoxide	<b>OARS WEEL (United States, 4/2022).</b> TWA: 250 ppm 8 hours.
<b>QuikChange Lightning Enzyme</b> Glycerol	<b>OSHA PEL 1989 (United States, 3/1989).</b> TWA: 5 mg/m <sup>3</sup> 8 hours. Form: Respirable fraction TWA: 10 mg/m <sup>3</sup> 8 hours. Form: Total dust <b>OSHA PEL (United States, 5/2018).</b> TWA: 5 mg/m <sup>3</sup> 8 hours. Form: Respirable fraction TWA: 15 mg/m <sup>3</sup> 8 hours. Form: Total dust <b>CAL OSHA PEL (United States, 5/2018).</b> TWA: 5 mg/m <sup>3</sup> 8 hours. Form: respirable fraction TWA: 10 mg/m <sup>3</sup> 8 hours. Form: total dust
<b>10X QuikChange Lightning Buffer</b> Potassium chloride Dodecyldimethyl(3-sulphonatopropyl)ammonium	None. None.
<b>Dpn I Enzyme</b> Glycerol	<b>OSHA PEL 1989 (United States, 3/1989).</b> TWA: 5 mg/m <sup>3</sup> 8 hours. Form: Respirable fraction TWA: 10 mg/m <sup>3</sup> 8 hours. Form: Total dust <b>OSHA PEL (United States, 5/2018).</b> TWA: 5 mg/m <sup>3</sup> 8 hours. Form: Respirable fraction



## Section 8. Exposure controls/personal protection

- Hand protection** : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.
- Body protection** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Other skin protection** : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Respiratory protection** : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

## Section 9. Physical and chemical properties and safety characteristics

The conditions of measurement of all properties are at standard temperature and pressure unless otherwise indicated.

### Appearance

<b>Physical state</b>	:	QuikSolution QuikChange Lightning Enzyme 10X QuikChange Lightning Buffer QuikChange XL dNTP Mix Dpn I Enzyme pWS4.5 Control Template Control Primer 1 (34-mer) Control Primer 2 (34-mer) XL10-Gold Ultracompetent cells XL10-Gold 2-Mercaptoethanol pUC 18 DNA Control Plasmid	Liquid. [Clear.] Liquid. Liquid. Liquid. Liquid. Liquid. Liquid. Liquid. Liquid. Liquid. Liquid.
<b>Color</b>	:	QuikSolution QuikChange Lightning Enzyme 10X QuikChange Lightning Buffer QuikChange XL dNTP Mix Dpn I Enzyme pWS4.5 Control Template Control Primer 1 (34-mer) Control Primer 2 (34-mer) XL10-Gold Ultracompetent cells XL10-Gold 2-Mercaptoethanol pUC 18 DNA Control Plasmid	Colorless. Not available. Not available. Not available. Not available. Not available. Not available. Not available. Not available. Not available. Not available.
<b>Odor</b>	:	QuikSolution QuikChange Lightning Enzyme 10X QuikChange Lightning Buffer QuikChange XL dNTP Mix Dpn I Enzyme pWS4.5 Control Template Control Primer 1 (34-mer) Control Primer 2 (34-mer) XL10-Gold Ultracompetent cells XL10-Gold 2-Mercaptoethanol pUC 18 DNA Control Plasmid	Slight [Slight] Not available. Not available. Not available. Not available. Not available. Not available. Not available. Not available. Not available. Not available.

## Section 9. Physical and chemical properties and safety characteristics

<b>Odor threshold</b>	: QuikSolution QuikChange Lightning Enzyme 10X QuikChange Lightning Buffer QuikChange XL dNTP Mix Dpn I Enzyme pWS4.5 Control Template Control Primer 1 (34-mer) Control Primer 2 (34-mer) XL10-Gold Ultracompetent cells XL10-Gold 2-Mercaptoethanol pUC 18 DNA Control Plasmid	Not available. Not available. Not available. Not available. Not available. Not available. Not available. Not available. Not available. Not available. Not available.
<b>pH</b>	: QuikSolution QuikChange Lightning Enzyme 10X QuikChange Lightning Buffer QuikChange XL dNTP Mix Dpn I Enzyme pWS4.5 Control Template Control Primer 1 (34-mer) Control Primer 2 (34-mer) XL10-Gold Ultracompetent cells XL10-Gold 2-Mercaptoethanol pUC 18 DNA Control Plasmid	Not available. 8.2 Not available. Not available. Not available. 7.5 7.5 7.5 6.4 Not available. 7.5
<b>Melting point/freezing point</b>	: QuikSolution QuikChange Lightning Enzyme 10X QuikChange Lightning Buffer QuikChange XL dNTP Mix Dpn I Enzyme pWS4.5 Control Template Control Primer 1 (34-mer) Control Primer 2 (34-mer) XL10-Gold Ultracompetent cells XL10-Gold 2-Mercaptoethanol pUC 18 DNA Control Plasmid	18.4°C (65.1°F) Not available. Not available. Not available. Not available. 0°C (32°F) 0°C (32°F) 0°C (32°F) Not available. Not available. 0°C (32°F)
<b>Boiling point, initial boiling point, and boiling range</b>	: QuikSolution QuikChange Lightning Enzyme 10X QuikChange Lightning Buffer QuikChange XL dNTP Mix Dpn I Enzyme pWS4.5 Control Template Control Primer 1 (34-mer) Control Primer 2 (34-mer) XL10-Gold Ultracompetent cells XL10-Gold 2-Mercaptoethanol pUC 18 DNA Control Plasmid	188.8°C (371.8°F) Not available. Not available. Not available. Not available. 100°C (212°F) 100°C (212°F) 100°C (212°F) Not available. Not available. 100°C (212°F)
<b>Flash point</b>	: QuikSolution  QuikChange Lightning Enzyme 10X QuikChange Lightning Buffer QuikChange XL dNTP Mix Dpn I Enzyme pWS4.5 Control Template Control Primer 1 (34-mer) Control Primer 2 (34-mer) XL10-Gold Ultracompetent cells XL10-Gold 2-Mercaptoethanol pUC 18 DNA Control Plasmid	Closed cup: 85°C (185°F) [ASTM D 93] Open cup: 87°C (188.6°F)  Not available. Not available. Not available. Not available. Not available. Not available. Not available. Not available. Not available. Not available.

## Section 9. Physical and chemical properties and safety characteristics

Ingredient name	Closed cup			Open cup		
	°C	°F	Method	°C	°F	Method
<b>QuikChange Lightning Enzyme</b>						
Glycerol	-	-	-	177	350.6	-
<b>Dpn I Enzyme</b>						
Glycerol	-	-	-	177	350.6	-
<b>XL10-Gold Ultracompetent cells</b>						
Dimethyl sulfoxide	87	188.6	ASTM D 93	87	188.6	-
Glycerol	-	-	-	177	350.6	-
<b>XL10-Gold 2-Mercaptoethanol</b>						
2-Mercaptoethanol	74	165.2	-	74	165.2	-

**Evaporation rate** : QuikSolution 0.026 (butyl acetate = 1)  
 QuikChange Lightning Enzyme Not available.  
 10X QuikChange Lightning Buffer Not available.  
 QuikChange XL dNTP Mix Not available.  
 Dpn I Enzyme Not available.  
 pWS4.5 Control Template Not available.  
 Control Primer 1 (34-mer) Not available.  
 Control Primer 2 (34-mer) Not available.  
 XL10-Gold Ultracompetent cells Not available.  
 XL10-Gold 2-Mercaptoethanol Not available.  
 pUC 18 DNA Control Plasmid Not available.

**Flammability** : QuikSolution Not applicable.  
 QuikChange Lightning Enzyme Not applicable.  
 10X QuikChange Lightning Buffer Not applicable.  
 QuikChange XL dNTP Mix Not applicable.  
 Dpn I Enzyme Not applicable.  
 pWS4.5 Control Template Not applicable.  
 Control Primer 1 (34-mer) Not applicable.  
 Control Primer 2 (34-mer) Not applicable.  
 XL10-Gold Ultracompetent cells Not applicable.  
 XL10-Gold 2-Mercaptoethanol Not applicable.  
 pUC 18 DNA Control Plasmid Not applicable.

**Lower and upper explosion limit/flammability limit** : QuikSolution Lower: 2.6%  
 Upper: 42%  
 QuikChange Lightning Enzyme Not available.  
 10X QuikChange Lightning Buffer Not available.  
 QuikChange XL dNTP Mix Not available.  
 Dpn I Enzyme Not available.  
 pWS4.5 Control Template Not available.  
 Control Primer 1 (34-mer) Not available.  
 Control Primer 2 (34-mer) Not available.  
 XL10-Gold Ultracompetent cells Not available.  
 XL10-Gold 2-Mercaptoethanol Not available.



## Section 9. Physical and chemical properties and safety characteristics

pUC 18 DNA Control Plasmid

Not available.

**Vapor pressure**

: QuikSolution

0.056 kPa (0.42 mm Hg) [EU A.4]

Ingredient name	Vapor Pressure at 20°C			Vapor pressure at 50°C		
	mm Hg	kPa	Method	mm Hg	kPa	Method
<b>QuikChange Lightning Enzyme</b>						
water	17.5	2.3	-	92.258	12.3	-
Glycerol	0.000075	0.00001	-	0.0025	0.00033	-
<b>10X QuikChange Lightning Buffer</b>						
water	17.5	2.3	-	92.258	12.3	-
<b>QuikChange XL dNTP Mix</b>						
water	17.5	2.3	-	92.258	12.3	-
<b>Dpn I Enzyme</b>						
water	17.5	2.3	-	92.258	12.3	-
Glycerol	0.000075	0.00001	-	0.0025	0.00033	-
<b>pWS4.5 Control Template</b>						
water	17.5	2.3	-	92.258	12.3	-
<b>Control Primer 1 (34-mer)</b>						
water	17.5	2.3	-	92.258	12.3	-
<b>Control Primer 2 (34-mer)</b>						
water	17.5	2.3	-	92.258	12.3	-
<b>XL10-Gold Ultracompetent cells</b>						
water	17.5	2.3	-	92.258	12.3	-
Dimethyl sulfoxide	0.42	0.056	EU A.4	-	-	-
<b>XL10-Gold</b>						

## Section 9. Physical and chemical properties and safety characteristics


<b>2-Mercaptoethanol</b>							
water	17.5	2.3	-	92.258	12.3	-	
2-Mercaptoethanol	0.97508	0.13	-	-	-	-	
<b>pUC 18 DNA Control Plasmid</b>							
water	17.5	2.3	-	92.258	12.3	-	


**Relative vapor density** : QuikSolution 2.71 [Air = 1]  
 QuikChange Lightning Enzyme Not available.  
 10X QuikChange Lightning Buffer Not available.  
 QuikChange XL dNTP Mix Not available.  
 Dpn I Enzyme Not available.  
 pWS4.5 Control Template Not available.  
 Control Primer 1 (34-mer) Not available.  
 Control Primer 2 (34-mer) Not available.  
 XL10-Gold Ultracompetent cells Not available.  
 XL10-Gold 2-Mercaptoethanol Not available.  
 pUC 18 DNA Control Plasmid Not available.


**Relative density** : QuikSolution 1.1  
 QuikChange Lightning Enzyme Not available.  
 10X QuikChange Lightning Buffer Not available.  
 QuikChange XL dNTP Mix Not available.  
 Dpn I Enzyme Not available.  
 pWS4.5 Control Template Not available.  
 Control Primer 1 (34-mer) Not available.  
 Control Primer 2 (34-mer) Not available.  
 XL10-Gold Ultracompetent cells Not available.  
 XL10-Gold 2-Mercaptoethanol Not available.  
 pUC 18 DNA Control Plasmid Not available.

<b>Solubility(ies)</b>	<b>Media</b>	<b>Result</b>
	<b>QuikSolution</b>	
	water	Soluble
	<b>QuikChange Lightning Enzyme</b>	
	water	Soluble
	<b>10X QuikChange Lightning Buffer</b>	
	water	Soluble
	<b>QuikChange XL dNTP Mix</b>	
	water	Soluble
	<b>Dpn I Enzyme</b>	
	water	Soluble
	<b>pWS4.5 Control Template</b>	
	water	Soluble
	<b>Control Primer 1 (34-mer)</b>	
	water	Soluble
	<b>Control Primer 2 (34-mer)</b>	
	water	Soluble
	<b>XL10-Gold Ultracompetent cells</b>	
	water	Soluble
	<b>XL10-Gold 2-Mercaptoethanol</b>	
	water	Soluble
	<b>pUC 18 DNA Control Plasmid</b>	
	water	Soluble


## Section 9. Physical and chemical properties and safety characteristics

**Partition coefficient: n-octanol/water** :  QuikSolution -2.029  
 QuikChange Lightning Enzyme Not applicable.  
 10X QuikChange Lightning Buffer Not applicable.  
 QuikChange XL dNTP Mix Not applicable.  
 Dpn I Enzyme Not applicable.  
 pWS4.5 Control Template Not applicable.  
 Control Primer 1 (34-mer) Not applicable.  
 Control Primer 2 (34-mer) Not applicable.  
 XL10-Gold Ultracompetent cells Not applicable.  
 XL10-Gold 2-Mercaptoethanol Not applicable.  
 pUC 18 DNA Control Plasmid Not applicable.

**Auto-ignition temperature** :  QuikSolution 300 to 302°C (572 to 575.6°F)

Ingredient name	°C	°F	Method
 <b>QuikChange Lightning Enzyme</b>			
Glycerol	370	698	-
<b>Dpn I Enzyme</b>			
Glycerol	370	698	-
<b>XL10-Gold Ultracompetent cells</b>			
Dimethyl sulfoxide	300 to 302	572 to 575.6	-
Glycerol	370	698	-
<b>XL10-Gold 2-Mercaptoethanol</b>			
2-Mercaptoethanol	295	563	-

**Decomposition temperature** : QuikSolution 140 to 189°C (284 to 372.2°F)  
 QuikChange Lightning Enzyme Not available.  
 10X QuikChange Lightning Buffer Not available.  
 QuikChange XL dNTP Mix Not available.  
 Dpn I Enzyme Not available.  
 pWS4.5 Control Template Not available.  
 Control Primer 1 (34-mer) Not available.  
 Control Primer 2 (34-mer) Not available.  
 XL10-Gold Ultracompetent cells Not available.  
 XL10-Gold 2-Mercaptoethanol Not available.  
 pUC 18 DNA Control Plasmid Not available.

**Viscosity** :  QuikSolution Dynamic: 2.14 mPa·s (2.14 cP)  
 QuikChange Lightning Enzyme Not available.  
 10X QuikChange Lightning Buffer Not available.  
 QuikChange XL dNTP Mix Not available.  
 Dpn I Enzyme Not available.  
 pWS4.5 Control Template Not available.  
 Control Primer 1 (34-mer) Not available.  
 Control Primer 2 (34-mer) Not available.  
 XL10-Gold Ultracompetent cells Not available.  
 XL10-Gold 2-Mercaptoethanol Not available.  
 pUC 18 DNA Control Plasmid Not available.

**Particle characteristics**

## Section 9. Physical and chemical properties and safety characteristics

<b>Median particle size</b>	: QuikSolution	Not applicable.
	QuikChange Lightning Enzyme	Not applicable.
	10X QuikChange Lightning Buffer	Not applicable.
	QuikChange XL dNTP Mix	Not applicable.
	Dpn I Enzyme	Not applicable.
	pWS4.5 Control Template	Not applicable.
	Control Primer 1 (34-mer)	Not applicable.
	Control Primer 2 (34-mer)	Not applicable.
	XL10-Gold Ultracompetent cells	Not applicable.
	XL10-Gold 2-Mercaptoethanol	Not applicable.
	pUC 18 DNA Control Plasmid	Not applicable.

## Section 10. Stability and reactivity

<b>10.1 Reactivity</b>	: QuikSolution	No specific test data related to reactivity available for this product or its ingredients.
	QuikChange Lightning Enzyme	No specific test data related to reactivity available for this product or its ingredients.
	10X QuikChange Lightning Buffer	No specific test data related to reactivity available for this product or its ingredients.
	QuikChange XL dNTP Mix	No specific test data related to reactivity available for this product or its ingredients.
	Dpn I Enzyme	No specific test data related to reactivity available for this product or its ingredients.
	pWS4.5 Control Template	No specific test data related to reactivity available for this product or its ingredients.
	Control Primer 1 (34-mer)	No specific test data related to reactivity available for this product or its ingredients.
	Control Primer 2 (34-mer)	No specific test data related to reactivity available for this product or its ingredients.
	XL10-Gold Ultracompetent cells	No specific test data related to reactivity available for this product or its ingredients.
	XL10-Gold 2-Mercaptoethanol	No specific test data related to reactivity available for this product or its ingredients.
	pUC 18 DNA Control Plasmid	No specific test data related to reactivity available for this product or its ingredients.

<b>10.2 Chemical stability</b>	: QuikSolution	The product is stable.
	QuikChange Lightning Enzyme	The product is stable.
	10X QuikChange Lightning Buffer	The product is stable.
	QuikChange XL dNTP Mix	The product is stable.
	Dpn I Enzyme	The product is stable.
	pWS4.5 Control Template	The product is stable.
	Control Primer 1 (34-mer)	The product is stable.
	Control Primer 2 (34-mer)	The product is stable.
	XL10-Gold Ultracompetent cells	The product is stable.
	XL10-Gold 2-Mercaptoethanol	The product is stable.
	pUC 18 DNA Control Plasmid	The product is stable.

<b>10.3 Possibility of hazardous reactions</b>	: QuikSolution	Under normal conditions of storage and use, hazardous reactions will not occur.
	QuikChange Lightning Enzyme	Under normal conditions of storage and use, hazardous reactions will not occur.
	10X QuikChange Lightning Buffer	Under normal conditions of storage and use, hazardous reactions will not occur.
	QuikChange XL dNTP Mix	Under normal conditions of storage and use, hazardous reactions will not occur.
	Dpn I Enzyme	Under normal conditions of storage and use, hazardous reactions will not occur.
	pWS4.5 Control Template	Under normal conditions of storage and use,

## Section 10. Stability and reactivity

Control Primer 1 (34-mer)	hazardous reactions will not occur.
Control Primer 2 (34-mer)	Under normal conditions of storage and use, hazardous reactions will not occur.
XL10-Gold Ultracompetent cells	Under normal conditions of storage and use, hazardous reactions will not occur.
XL10-Gold 2-Mercaptoethanol	Under normal conditions of storage and use, hazardous reactions will not occur.
pUC 18 DNA Control Plasmid	Under normal conditions of storage and use, hazardous reactions will not occur.

### 10.4 Conditions to avoid

QuikSolution	Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Do not allow vapor to accumulate in low or confined areas.
QuikChange Lightning Enzyme	No specific data.
10X QuikChange Lightning Buffer	No specific data.
QuikChange XL dNTP Mix	No specific data.
Dpn I Enzyme	No specific data.
pWS4.5 Control Template	No specific data.
Control Primer 1 (34-mer)	No specific data.
Control Primer 2 (34-mer)	No specific data.
XL10-Gold Ultracompetent cells	No specific data.
XL10-Gold 2-Mercaptoethanol	No specific data.
pUC 18 DNA Control Plasmid	No specific data.

### 10.5 Incompatible materials

QuikSolution	Reactive or incompatible with the following materials: oxidizing materials
QuikChange Lightning Enzyme	May react or be incompatible with oxidizing materials.
10X QuikChange Lightning Buffer	May react or be incompatible with oxidizing materials.
QuikChange XL dNTP Mix	May react or be incompatible with oxidizing materials.
Dpn I Enzyme	May react or be incompatible with oxidizing materials.
pWS4.5 Control Template	May react or be incompatible with oxidizing materials.
Control Primer 1 (34-mer)	May react or be incompatible with oxidizing materials.
Control Primer 2 (34-mer)	May react or be incompatible with oxidizing materials.
XL10-Gold Ultracompetent cells	May react or be incompatible with oxidizing materials.
XL10-Gold 2-Mercaptoethanol	May react or be incompatible with oxidizing materials.
pUC 18 DNA Control Plasmid	May react or be incompatible with oxidizing materials.

### 10.6 Hazardous decomposition products

QuikSolution	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
QuikChange Lightning Enzyme	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
10X QuikChange Lightning Buffer	Under normal conditions of storage and use,

## Section 10. Stability and reactivity

QuikChange XL dNTP Mix	hazardous decomposition products should not be produced. Under normal conditions of storage and use, hazardous decomposition products should not be produced.
Dpn I Enzyme	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
pWS4.5 Control Template	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
Control Primer 1 (34-mer)	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
Control Primer 2 (34-mer)	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
XL10-Gold Ultracompetent cells	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
XL10-Gold 2-Mercaptoethanol	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
pUC 18 DNA Control Plasmid	Under normal conditions of storage and use, hazardous decomposition products should not be produced.

## Section 11. Toxicological information

### 11.1 Information on toxicological effects

#### Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
<b>QuikSolution</b> Dimethyl sulfoxide	LD50 Dermal LD50 Oral	Rat Rat	40000 mg/kg 14500 mg/kg	- -
<b>QuikChange Lightning Enzyme</b> Glycerol	LD50 Oral	Rat	12600 mg/kg	-
<b>10X QuikChange Lightning Buffer</b> Potassium chloride	LD50 Oral	Rat	2600 mg/kg	-
<b>Dpn I Enzyme</b> Glycerol	LD50 Oral	Rat	12600 mg/kg	-
<b>XL10-Gold Ultracompetent cells</b> Glycerol Dimethyl sulfoxide	LD50 Oral LD50 Dermal LD50 Oral	Rat Rat Rat	12600 mg/kg 40000 mg/kg 14500 mg/kg	- - -
Potassium chloride	LD50 Oral	Rat	2600 mg/kg	-
<b>XL10-Gold 2-Mercaptoethanol</b> 2-Mercaptoethanol	LD50 Oral	Rat	244 mg/kg	-

#### Irritation/Corrosion

## Section 11. Toxicological information

Product/ingredient name	Result	Species	Score	Exposure	Observation
<b>QuikSolution</b> Dimethyl sulfoxide	Eyes - Mild irritant Eyes - Mild irritant	Rabbit Rabbit	- -	100 mg 24 hours 500	- -
	Skin - Mild irritant Skin - Mild irritant	Rabbit Rabbit	- -	100 mg 24 hours 500	- -
<b>QuikChange Lightning Enzyme</b> Glycerol	Eyes - Mild irritant	Rabbit	-	24 hours 500	-
	Skin - Mild irritant	Rabbit	-	24 hours 500	-
<b>10X QuikChange Lightning Buffer</b> Potassium chloride	Eyes - Mild irritant	Rabbit	-	24 hours 500	-
<b>Dpn I Enzyme</b> Glycerol	Eyes - Mild irritant	Rabbit	-	24 hours 500	-
	Skin - Mild irritant	Rabbit	-	24 hours 500	-
<b>XL10-Gold Ultracompetent cells</b> Glycerol	Eyes - Mild irritant	Rabbit	-	24 hours 500	-
	Skin - Mild irritant	Rabbit	-	24 hours 500	-
Dimethyl sulfoxide	Eyes - Mild irritant Eyes - Mild irritant	Rabbit Rabbit	- -	100 mg 24 hours 500	- -
	Skin - Mild irritant Skin - Mild irritant	Rabbit Rabbit	- -	100 mg 24 hours 500	- -
Potassium chloride	Eyes - Mild irritant	Rabbit	-	24 hours 500	-
<b>XL10-Gold 2-Mercaptoethanol</b> 2-Mercaptoethanol	Eyes - Severe irritant	Rabbit	-	2 mg	-

### Sensitization

Not available.

### Mutagenicity

**Conclusion/Summary** : Not available.

### Carcinogenicity

**Conclusion/Summary** : Not available.

### Reproductive toxicity

**Conclusion/Summary** : Not available.

### Teratogenicity

**Conclusion/Summary** : Not available.

## Section 11. Toxicological information

### Specific target organ toxicity (single exposure)

Name	Category	Route of exposure	Target organs
<b>10X QuikChange Lightning Buffer</b> Dodecyldimethyl(3-sulphonatopropyl)ammonium	Category 3	-	Respiratory tract irritation

### Specific target organ toxicity (repeated exposure)

Name	Category	Route of exposure	Target organs
<b>XL10-Gold 2-Mercaptoethanol</b> 2-Mercaptoethanol	Category 2	-	heart, liver

### Aspiration hazard

Not available.

### Information on the likely routes of exposure

QuikSolution	Routes of entry anticipated: Oral, Dermal, Inhalation, Eyes.
QuikChange Lightning Enzyme	Routes of entry anticipated: Oral, Dermal, Inhalation, Eyes.
10X QuikChange Lightning Buffer	Routes of entry anticipated: Oral, Dermal, Inhalation, Eyes.
QuikChange XL dNTP Mix	Not available.
Dpn I Enzyme	Routes of entry anticipated: Oral, Dermal, Inhalation, Eyes.
pWS4.5 Control Template	Not available.
Control Primer 1 (34-mer)	Not available.
Control Primer 2 (34-mer)	Not available.
XL10-Gold Ultracompetent cells	Routes of entry anticipated: Oral, Dermal, Inhalation, Eyes.
XL10-Gold 2-Mercaptoethanol	Routes of entry anticipated: Oral, Dermal, Inhalation, Eyes.
pUC 18 DNA Control Plasmid	Not available.

### Potential acute health effects

#### Eye contact

QuikSolution	Causes eye irritation.
QuikChange Lightning Enzyme	Causes eye irritation.
10X QuikChange Lightning Buffer	No known significant effects or critical hazards.
QuikChange XL dNTP Mix	No known significant effects or critical hazards.
Dpn I Enzyme	Causes eye irritation.
pWS4.5 Control Template	No known significant effects or critical hazards.
Control Primer 1 (34-mer)	No known significant effects or critical hazards.
Control Primer 2 (34-mer)	No known significant effects or critical hazards.
XL10-Gold Ultracompetent cells	Causes eye irritation.
XL10-Gold 2-Mercaptoethanol	Causes serious eye damage.
pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.

#### Inhalation

QuikSolution	No known significant effects or critical hazards.
QuikChange Lightning Enzyme	No known significant effects or critical hazards.
10X QuikChange Lightning Buffer	No known significant effects or critical hazards.
QuikChange XL dNTP Mix	No known significant effects or critical hazards.
Dpn I Enzyme	No known significant effects or critical hazards.
pWS4.5 Control Template	No known significant effects or critical hazards.
Control Primer 1 (34-mer)	No known significant effects or critical hazards.
Control Primer 2 (34-mer)	No known significant effects or critical hazards.
XL10-Gold Ultracompetent cells	No known significant effects or critical hazards.
XL10-Gold 2-Mercaptoethanol	No known significant effects or critical hazards.
pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.



## Section 11. Toxicological information

<b>Skin contact</b>	: QuikSolution QuikChange Lightning Enzyme 10X QuikChange Lightning Buffer QuikChange XL dNTP Mix Dpn I Enzyme pWS4.5 Control Template Control Primer 1 (34-mer) Control Primer 2 (34-mer) XL10-Gold Ultracompetent cells XL10-Gold 2-Mercaptoethanol pUC 18 DNA Control Plasmid	No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. May cause an allergic skin reaction. No known significant effects or critical hazards.
<b>Ingestion</b>	: QuikSolution QuikChange Lightning Enzyme 10X QuikChange Lightning Buffer QuikChange XL dNTP Mix Dpn I Enzyme pWS4.5 Control Template Control Primer 1 (34-mer) Control Primer 2 (34-mer) XL10-Gold Ultracompetent cells XL10-Gold 2-Mercaptoethanol pUC 18 DNA Control Plasmid	No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards.

### Symptoms related to the physical, chemical and toxicological characteristics

<b>Eye contact</b>	: QuikSolution  QuikChange Lightning Enzyme  10X QuikChange Lightning Buffer QuikChange XL dNTP Mix Dpn I Enzyme  pWS4.5 Control Template Control Primer 1 (34-mer) Control Primer 2 (34-mer) XL10-Gold Ultracompetent cells  XL10-Gold 2-Mercaptoethanol  pUC 18 DNA Control Plasmid	Adverse symptoms may include the following: irritation watering redness Adverse symptoms may include the following: irritation watering redness No specific data. No specific data. Adverse symptoms may include the following: irritation watering redness No specific data. No specific data. No specific data. Adverse symptoms may include the following: irritation watering redness Adverse symptoms may include the following: pain watering redness No specific data.
<b>Inhalation</b>	: QuikSolution QuikChange Lightning Enzyme 10X QuikChange Lightning Buffer QuikChange XL dNTP Mix Dpn I Enzyme pWS4.5 Control Template Control Primer 1 (34-mer) Control Primer 2 (34-mer)	No specific data. No specific data. No specific data. No specific data. No specific data. No specific data. No specific data.

## Section 11. Toxicological information

	XL10-Gold Ultracompetent cells	No specific data.
	XL10-Gold 2-Mercaptoethanol	Adverse symptoms may include the following: reduced fetal weight increase in fetal deaths skeletal malformations
<b>Skin contact</b>	pUC 18 DNA Control Plasmid	No specific data.
	: QuikSolution	No specific data.
	QuikChange Lightning Enzyme	No specific data.
	10X QuikChange Lightning Buffer	No specific data.
	QuikChange XL dNTP Mix	No specific data.
	Dpn I Enzyme	No specific data.
	pWS4.5 Control Template	No specific data.
	Control Primer 1 (34-mer)	No specific data.
	Control Primer 2 (34-mer)	No specific data.
	XL10-Gold Ultracompetent cells	No specific data.
	XL10-Gold 2-Mercaptoethanol	Adverse symptoms may include the following: pain or irritation redness blistering may occur reduced fetal weight increase in fetal deaths skeletal malformations
<b>Ingestion</b>	pUC 18 DNA Control Plasmid	No specific data.
	: QuikSolution	No specific data.
	QuikChange Lightning Enzyme	No specific data.
	10X QuikChange Lightning Buffer	No specific data.
	QuikChange XL dNTP Mix	No specific data.
	Dpn I Enzyme	No specific data.
	pWS4.5 Control Template	No specific data.
	Control Primer 1 (34-mer)	No specific data.
	Control Primer 2 (34-mer)	No specific data.
	XL10-Gold Ultracompetent cells	No specific data.
	XL10-Gold 2-Mercaptoethanol	Adverse symptoms may include the following: stomach pains reduced fetal weight increase in fetal deaths skeletal malformations
	pUC 18 DNA Control Plasmid	No specific data.

### Delayed and immediate effects and also chronic effects from short and long term exposure

#### Short term exposure

**Potential immediate effects** : Not available.

**Potential delayed effects** : Not available.

#### Long term exposure

**Potential immediate effects** : Not available.

**Potential delayed effects** : Not available.

#### Potential chronic health effects

<b>General</b>	: QuikSolution	No known significant effects or critical hazards.
	QuikChange Lightning Enzyme	No known significant effects or critical hazards.
	10X QuikChange Lightning Buffer	No known significant effects or critical hazards.
	QuikChange XL dNTP Mix	No known significant effects or critical hazards.
	Dpn I Enzyme	No known significant effects or critical hazards.
	pWS4.5 Control Template	No known significant effects or critical hazards.
	Control Primer 1 (34-mer)	No known significant effects or critical hazards.

## Section 11. Toxicological information

	Control Primer 2 (34-mer)	No known significant effects or critical hazards.
	XL10-Gold Ultracompetent cells	No known significant effects or critical hazards.
	XL10-Gold 2-Mercaptoethanol	May cause damage to organs through prolonged or repeated exposure. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.
<b>Carcinogenicity</b>	pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.
	: QuikSolution	No known significant effects or critical hazards.
	QuikChange Lightning Enzyme	No known significant effects or critical hazards.
	10X QuikChange Lightning Buffer	No known significant effects or critical hazards.
	QuikChange XL dNTP Mix	No known significant effects or critical hazards.
	Dpn I Enzyme	No known significant effects or critical hazards.
	pWS4.5 Control Template	No known significant effects or critical hazards.
	Control Primer 1 (34-mer)	No known significant effects or critical hazards.
	Control Primer 2 (34-mer)	No known significant effects or critical hazards.
	XL10-Gold Ultracompetent cells	No known significant effects or critical hazards.
<b>Mutagenicity</b>	XL10-Gold 2-Mercaptoethanol	No known significant effects or critical hazards.
	pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.
	: QuikSolution	No known significant effects or critical hazards.
	QuikChange Lightning Enzyme	No known significant effects or critical hazards.
	10X QuikChange Lightning Buffer	No known significant effects or critical hazards.
	QuikChange XL dNTP Mix	No known significant effects or critical hazards.
	Dpn I Enzyme	No known significant effects or critical hazards.
	pWS4.5 Control Template	No known significant effects or critical hazards.
	Control Primer 1 (34-mer)	No known significant effects or critical hazards.
	Control Primer 2 (34-mer)	No known significant effects or critical hazards.
<b>Reproductive toxicity</b>	XL10-Gold Ultracompetent cells	No known significant effects or critical hazards.
	XL10-Gold 2-Mercaptoethanol	No known significant effects or critical hazards.
	pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.
	: QuikSolution	No known significant effects or critical hazards.
	QuikChange Lightning Enzyme	No known significant effects or critical hazards.
	10X QuikChange Lightning Buffer	No known significant effects or critical hazards.
	QuikChange XL dNTP Mix	No known significant effects or critical hazards.
	Dpn I Enzyme	No known significant effects or critical hazards.
	pWS4.5 Control Template	No known significant effects or critical hazards.
	Control Primer 1 (34-mer)	No known significant effects or critical hazards.
Control Primer 2 (34-mer)	No known significant effects or critical hazards.	
XL10-Gold Ultracompetent cells	No known significant effects or critical hazards.	
XL10-Gold 2-Mercaptoethanol	Suspected of damaging fertility or the unborn child.	
pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.	

### Numerical measures of toxicity

#### Acute toxicity estimates

Product/ingredient name	Oral (mg/kg)	Dermal (mg/kg)	Inhalation (gases) (ppm)	Inhalation (vapors) (mg/l)	Inhalation (dusts and mists) (mg/l)
<b>QuikSolution</b> Dimethyl sulfoxide	14500	40000	N/A	N/A	N/A
<b>QuikChange Lightning Enzyme</b> Glycerol	12600	N/A	N/A	N/A	N/A
<b>10X QuikChange Lightning Buffer</b> 10X QuikChange Lightning Buffer	17820.3	55000.0	N/A	550.0	N/A
Potassium chloride	2600	N/A	N/A	N/A	N/A
Dodecyldimethyl(3-sulphonatopropyl)ammonium	500	1100	N/A	11	N/A

## Section 11. Toxicological information

<b>Dpn I Enzyme</b>					
Dpn I Enzyme	130435.3	N/A	N/A	N/A	N/A
Glycerol	12600	N/A	N/A	N/A	N/A
<b>XL10-Gold Ultracompetent cells</b>					
XL10-Gold Ultracompetent cells	136842.1	N/A	N/A	N/A	N/A
Glycerol	12600	N/A	N/A	N/A	N/A
Dimethyl sulfoxide	14500	40000	N/A	N/A	N/A
Potassium chloride	2600	N/A	N/A	N/A	N/A
<b>XL10-Gold 2-Mercaptoethanol</b>					
XL10-Gold 2-Mercaptoethanol	4615.5	4545.5	N/A	60.7	N/A
2-Mercaptoethanol	244	200	N/A	3	N/A

## Section 12. Ecological information

### 12.1 Toxicity

Product/ingredient name	Result	Species	Exposure
<b>QuikSolution</b> Dimethyl sulfoxide	Acute LC50 25000 ppm Fresh water Acute LC50 34000000 µg/l Fresh water Chronic NOEC 100 ul/L Marine water Chronic NOEC 100 ul/L Fresh water	Daphnia - <i>Daphnia magna</i> - Neonate Fish - <i>Pimephales promelas</i> Algae - <i>Ulva lactuca</i> Daphnia - <i>Daphnia magna</i> - Juvenile (Fledgling, Hatchling, Weanling)	48 hours 96 hours 72 hours 21 days
<b>QuikChange Lightning Enzyme</b> Glycerol	Acute LC50 54000 mg/l Fresh water	Fish - <i>Oncorhynchus mykiss</i>	96 hours
<b>10X QuikChange Lightning Buffer</b> Potassium chloride	Acute EC50 9.24 g/L Fresh water Acute EC50 1337000 µg/l Fresh water Acute LC50 9.68 mg/l Fresh water Acute LC50 93000 µg/l Fresh water Acute LC50 509.65 mg/l Fresh water	Algae - <i>Desmodesmus subspicatus</i> Algae - <i>Navicula seminulum</i> Crustaceans - <i>Pseudosida ramosa</i> - Neonate Daphnia - <i>Daphnia magna</i> Fish - <i>Danio rerio</i>	72 hours 96 hours 48 hours 48 hours 96 hours
<b>Dpn I Enzyme</b> Glycerol	Acute LC50 54000 mg/l Fresh water	Fish - <i>Oncorhynchus mykiss</i>	96 hours
<b>XL10-Gold Ultracompetent cells</b> Glycerol Dimethyl sulfoxide	Acute LC50 54000 mg/l Fresh water Acute LC50 25000 ppm Fresh water Acute LC50 34000000 µg/l Fresh water Chronic NOEC 100 ul/L Marine water Chronic NOEC 100 ul/L Fresh water	Fish - <i>Oncorhynchus mykiss</i> Daphnia - <i>Daphnia magna</i> - Neonate Fish - <i>Pimephales promelas</i> Algae - <i>Ulva lactuca</i> Daphnia - <i>Daphnia magna</i> - Juvenile (Fledgling, Hatchling, Weanling)	96 hours 48 hours 96 hours 72 hours 21 days
Potassium chloride	Acute EC50 9.24 g/L Fresh water	Algae - <i>Desmodesmus</i>	72 hours

## Section 12. Ecological information

	Acute EC50 1337000 µg/l Fresh water Acute LC50 9.68 mg/l Fresh water	<i>subspicatus</i> Algae - <i>Navicula seminulum</i> Crustaceans - <i>Pseudosida ramosa</i> - Neonate	96 hours 48 hours
	Acute LC50 93000 µg/l Fresh water Acute LC50 509.65 mg/l Fresh water	Daphnia - <i>Daphnia magna</i> Fish - <i>Danio rerio</i>	48 hours 96 hours
<b>XL10-Gold 2-Mercaptoethanol</b> 2-Mercaptoethanol	Acute EC50 0.4 mg/l Fresh water	Daphnia	48 hours

### 12.2 Persistence and degradability

Product/ingredient name	Test	Result	Dose	Inoculum
<b>QuikSolution</b> Dimethyl sulfoxide	OECD 301D Ready Biodegradability - Closed Bottle Test	31 % - Not readily - 28 days	-	-
<b>QuikChange Lightning Enzyme</b> Glycerol	301D Ready Biodegradability - Closed Bottle Test	93 % - 30 days	-	-
<b>Dpn I Enzyme</b> Glycerol	301D Ready Biodegradability - Closed Bottle Test	93 % - 30 days	-	-
<b>XL10-Gold Ultracompetent cells</b> Glycerol	301D Ready Biodegradability - Closed Bottle Test	93 % - 30 days	-	-
Dimethyl sulfoxide	OECD 301D Ready Biodegradability - Closed Bottle Test	31 % - Not readily - 28 days	-	-
<b>XL10-Gold 2-Mercaptoethanol</b> 2-Mercaptoethanol	OECD 310 Ready Biodegradability - CO <sub>2</sub> in Sealed Vessels (Headspace Test)	69 % - Not readily - 60 days	20 mg/l	-

## Section 12. Ecological information

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
<b>QuikSolution</b> Dimethyl sulfoxide	-	-	Not readily
<b>10X QuikChange Lightning Buffer</b> Potassium chloride	-	-	Readily
<b>XL10-Gold Ultracompetent cells</b> Dimethyl sulfoxide Potassium chloride	- -	- -	Not readily Readily
<b>XL10-Gold 2-Mercaptoethanol</b> 2-Mercaptoethanol	-	-	Not readily

### 12.3 Bioaccumulative potential

Product/ingredient name	LogP <sub>ow</sub>	BCF	Potential
<b>QuikSolution</b> Dimethyl sulfoxide	-2.029	3.16	Low
<b>QuikChange Lightning Enzyme</b> Glycerol	-1.76	-	Low
<b>10X QuikChange Lightning Buffer</b> Potassium chloride	-0.46	-	Low
<b>Dpn I Enzyme</b> Glycerol	-1.76	-	Low
<b>XL10-Gold Ultracompetent cells</b> Glycerol Dimethyl sulfoxide Potassium chloride	-1.76 -1.35 -0.46	- 3.16 -	Low Low Low
<b>XL10-Gold 2-Mercaptoethanol</b> 2-Mercaptoethanol	-0.056	-	Low

### 12.4 Mobility in soil

**Soil/water partition coefficient (K<sub>oc</sub>)** : Not available.

**12.5 Other adverse effects** : No known significant effects or critical hazards.

## Section 13. Disposal considerations

### 13.1 Waste treatment methods

**Disposal methods** : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations. Local regulations may be more stringent than regional or national requirements.

The information presented below only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

## Section 14. Transport information

**DOT / TDG / Mexico / IMDG / IATA** : Not regulated.

**Special precautions for user** : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

**Transport in bulk according to IMO instruments** : Not available.

## Section 15. Regulatory information

### 15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

**U.S. Federal regulations** : TSCA 8(a) CDR Exempt/Partial exemption: Not determined  
Clean Water Act (CWA) 311: Edetic acid

**Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs)** : Listed

**Clean Air Act Section 602 Class I Substances** : Not listed

**Clean Air Act Section 602 Class II Substances** : Not listed

**DEA List I Chemicals (Precursor Chemicals)** : Not listed

**DEA List II Chemicals (Essential Chemicals)** : Not listed

**SARA 302/304**

## Section 15. Regulatory information


### Composition/information on ingredients

No products were found.

**SARA 304 RQ** : Not applicable.


### SARA 311/312

#### **Classification**

:  QuikSolution

QuikChange Lightning Enzyme	FLAMMABLE LIQUIDS - Category 4
10X QuikChange Lightning Buffer	EYE IRRITATION - Category 2B
QuikChange XL dNTP Mix	EYE IRRITATION - Category 2B
Dpn I Enzyme	Not applicable.
pWS4.5 Control Template	Not applicable.
Control Primer 1 (34-mer)	EYE IRRITATION - Category 2B
Control Primer 2 (34-mer)	Not applicable.
XL10-Gold Ultracompetent cells	Not applicable.
XL10-Gold 2-Mercaptoethanol	EYE IRRITATION - Category 2B
	SERIOUS EYE DAMAGE - Category 1
	SKIN SENSITIZATION - Category 1
	TOXIC TO REPRODUCTION - Category 2
	SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2
pUC 18 DNA Control Plasmid	Not applicable.

### Composition/information on ingredients

Name	%	Classification
 <b>QuikSolution</b>		
Dimethyl sulfoxide	100	FLAMMABLE LIQUIDS - Category 4 EYE IRRITATION - Category 2B
<b>QuikChange Lightning Enzyme</b>		
Glycerol	≥50 - ≤75	EYE IRRITATION - Category 2B
<b>10X QuikChange Lightning Buffer</b>		
Potassium chloride	≤5	EYE IRRITATION - Category 2B
Dodecyldimethyl (3-sulphonatopropyl)ammonium	≤3	ACUTE TOXICITY (oral) - Category 4 ACUTE TOXICITY (dermal) - Category 4 ACUTE TOXICITY (inhalation) - Category 4 SKIN IRRITATION - Category 2 EYE IRRITATION - Category 2A SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3
<b>Dpn I Enzyme</b>		
Glycerol	≥50 - ≤75	EYE IRRITATION - Category 2B
<b>XL10-Gold Ultracompetent cells</b>		
Glycerol	≥10 - ≤25	EYE IRRITATION - Category 2B
Dimethyl sulfoxide	≤10	FLAMMABLE LIQUIDS - Category 4 EYE IRRITATION - Category 2B
Sucrose	≤10	COMBUSTIBLE DUSTS
Potassium chloride	≤3	EYE IRRITATION - Category 2B
<b>XL10-Gold 2-Mercaptoethanol</b>		
2-Mercaptoethanol	≤5	FLAMMABLE LIQUIDS - Category 4 ACUTE TOXICITY (oral) - Category 3 ACUTE TOXICITY (dermal) - Category 2 ACUTE TOXICITY (inhalation) - Category 3 SKIN IRRITATION - Category 2 SERIOUS EYE DAMAGE - Category 1 SKIN SENSITIZATION - Category 1A TOXIC TO REPRODUCTION - Category 2 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2

### SARA 313



## Section 15. Regulatory information

	Product name	CAS number	%
Form R - Reporting requirements	10X QuikChange Lightning Buffer Ammonium sulphate	7783-20-2	≤3
Supplier notification	10X QuikChange Lightning Buffer Ammonium sulphate	7783-20-2	≤3

SARA 313 notifications must not be detached from the SDS and any copying and redistribution of the SDS shall include copying and redistribution of the notice attached to copies of the SDS subsequently redistributed.

### State regulations

- Massachusetts** : The following components are listed: GLYCERINE MIST
- New York** : None of the components are listed.
- New Jersey** : The following components are listed: GLYCERIN; DIMETHYL SULFOXIDE; METHANE, SULFINYLBI-
- Pennsylvania** : The following components are listed: 1,2,3-PROPANETRIOL
- California Prop. 65**

This product does not require a Safe Harbor warning under California Prop. 65.

### International regulations

#### Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

#### Montreal Protocol

Not listed.

#### Stockholm Convention on Persistent Organic Pollutants

Not listed.

#### Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

#### UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

### Inventory list

- Australia** : Not determined.
- Canada** : Not determined.
- China** : Not determined.
- Japan** : **Japan inventory (CSCL):** Not determined.  
**Japan inventory (ISHL):** Not determined.
- New Zealand** : Not determined.
- Philippines** : Not determined.
- Republic of Korea** : Not determined.
- Taiwan** : All components are listed or exempted.
- Thailand** : Not determined.
- Turkey** : Not determined.
- United States** : Not determined.
- Viet Nam** : Not determined.

## Section 16. Other information

### Procedure used to derive the classification

Classification	Justification
<b>QuikSolution</b> FLAMMABLE LIQUIDS - Category 4 EYE IRRITATION - Category 2B	On basis of test data On basis of test data
<b>QuikChange Lightning Enzyme</b> EYE IRRITATION - Category 2B	Calculation method
<b>Dpn I Enzyme</b> EYE IRRITATION - Category 2B	Calculation method
<b>XL10-Gold Ultracompetent cells</b> EYE IRRITATION - Category 2B	Calculation method
<b>XL10-Gold 2-Mercaptoethanol</b> SERIOUS EYE DAMAGE - Category 1 SKIN SENSITIZATION - Category 1 TOXIC TO REPRODUCTION - Category 2 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2 AQUATIC HAZARD (LONG-TERM) - Category 3	Calculation method Calculation method Calculation method Calculation method Calculation method

### History

**Date of issue/Date of revision** : 02/16/2024

**Date of previous issue** : 03/19/2021

**Version** : 8

### Key to abbreviations

: ATE = Acute Toxicity Estimate  
 BCF = Bioconcentration Factor  
 GHS = Globally Harmonized System of Classification and Labelling of Chemicals  
 IATA = International Air Transport Association  
 IBC = Intermediate Bulk Container  
 IMDG = International Maritime Dangerous Goods  
 LogPow = logarithm of the octanol/water partition coefficient  
 MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)  
 N/A = Not available  
 UN = United Nations

🔍 Indicates information that has changed from previously issued version.

### Notice to reader

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