

# SAFETY DATA SHEET



QuikChange II XL Site-Directed Mutagenesis Kit, Part Number 200522

## SECTION 1: Identification of the substance/mixture and of the company/undertaking

### 1.1 Product identifier

<b>Product name</b>	: QuikChange II XL Site-Directed Mutagenesis Kit, Part Number 200522
<b>Part No. (Kit)</b>	: 200522
<b>Part No.</b>	: QuikSolution 200516-51
	PfuUltra HF DNA 200524-51
	Polymerase
	10X Reaction Buffer 200518-58
	Dpn I 200518-52
	Control Primer 1 200518-53
	(34-mer)
	Control Primer 2 200518-54
	(34-mer)
	pWS4.5 Control 200518-55
	Template
	QuikChange XL dNTP 200516-52
	Mix
	XL10-Gold 200315-41
	Ultracompetent cells
	XL10-Gold 200314-43
	2-Mercaptoethanol
	pUC 18 DNA Control 200231-42
	Plasmid

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

Identified uses	
Analytical reagent.	
QuikSolution	0.5 mL
PfuUltra HF DNA Polymerase	0.032 mL (80 U 2.5 U/μl)
10X Reaction Buffer	0.5 mL
Dpn I	0.03 mL (10 U/μl 300 U)
Control Primer 1 (34-mer)	0.0075 mL (750 ng 100 ng/μl)
Control Primer 2 (34-mer)	0.0075 mL (750 ng 100 ng/μl)
pWS4.5 Control Template	0.01 mL (50 ng 5 ng/μl)
QuikChange XL dNTP Mix	0.03 mL
XL10-Gold Ultracompetent cells	1.35 mL (10 x 0.135 mL)
XL10-Gold 2-Mercaptoethanol	2 x 0.5 mL
pUC 18 DNA Control Plasmid	0.01 mL (0.1 ng/μl)

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

Agilent Technologies Manufacturing GmbH & Co. KG  
Hewlett-Packard-Str. 8  
76337 Waldbronn  
Germany  
0800 603 1000

**e-mail address of person responsible for this SDS** : pdl-msds\_author@agilent.com

### 1.4 Emergency telephone number

**Emergency telephone number (with hours of operation)** : CHEMTREC®: +(44)-870-8200418

**Date of issue/Date of revision** : 18/10/2016

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**SECTION 2: Hazards identification****2.1 Classification of the substance or mixture**

<b>Product definition</b>	: QuikSolution	Mono-constituent substance
	PfuUltra HF DNA Polymerase	Mixture
	10X Reaction Buffer	Mixture
	Dpn I	Mixture
	Control Primer 1 (34-mer)	Mixture
	Control Primer 2 (34-mer)	Mixture
	pWS4.5 Control Template	Mixture
	QuikChange XL dNTP Mix	Mixture
	XL10-Gold	Mixture
	Ultracompetent cells	
	XL10-Gold	Mixture
	2-Mercaptoethanol	
	pUC 18 DNA Control Plasmid	Mixture

**Classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]****10X Reaction Buffer**

H319 SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2

**XL10-Gold 2-Mercaptoethanol**

H318 SERIOUS EYE DAMAGE/EYE IRRITATION - Category 1

H317 SKIN SENSITISATION - Category 1

H412 LONG-TERM AQUATIC HAZARD - Category 3

**Ingredients of unknown toxicity** : QuikChange XL dNTP Mix Percentage of the mixture consisting of ingredient(s) of unknown toxicity: 5.7%

**Ingredients of unknown ecotoxicity** : QuikChange XL dNTP Mix Percentage of the mixture consisting of ingredient(s) of unknown hazards to the aquatic environment: 5.7%

See Section 16 for the full text of the H statements declared above.

See Section 11 for more detailed information on health effects and symptoms.

**2.2 Label elements****Hazard pictograms****Signal word**

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

## SECTION 2: Hazards identification

<b>Hazard statements</b>	: QuikSolution PfuUltra HF DNA Polymerase 10X Reaction Buffer  Dpn I Control Primer 1 (34-mer) Control Primer 2 (34-mer) pWS4.5 Control Template QuikChange XL dNTP Mix 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.  <b>GHS07 -</b> Causes serious eye irritation. 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>GHS05 -</b> Causes serious eye damage. <b>GHS07 -</b> May cause an allergic skin reaction. Harmful to aquatic life with long lasting effects. No known significant effects or critical hazards.
<b>Precautionary statements</b>		
<b>Prevention</b>	: QuikSolution PfuUltra HF DNA Polymerase 10X Reaction Buffer  Dpn I Control Primer 1 (34-mer) Control Primer 2 (34-mer) pWS4.5 Control Template QuikChange XL dNTP Mix XL10-Gold Ultracompetent cells XL10-Gold 2-Mercaptoethanol   pUC 18 DNA Control Plasmid	Not applicable. Not applicable.  P280 - Wear eye or face protection. P264 - Wash hands thoroughly after handling. Not applicable. Not applicable.  Not applicable.  Not applicable.  Not applicable.  Not applicable.  P280 - Wear protective gloves. Wear eye or face protection.  P273 - Avoid release to the environment. Not applicable.
<b>Response</b>	: QuikSolution PfuUltra HF DNA Polymerase 10X Reaction Buffer  Dpn I Control Primer 1 (34-mer) Control Primer 2 (34-mer) pWS4.5 Control Template QuikChange XL dNTP Mix XL10-Gold Ultracompetent cells	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. Not applicable. Not applicable.  Not applicable.  Not applicable.  Not applicable.  Not applicable.



**SECTION 2: Hazards identification**

	2-Mercaptoethanol	
	pUC 18 DNA Control Plasmid	Not applicable.
<b>Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles</b>	QuikSolution	Not applicable.
	PfuUltra HF DNA Polymerase	Not applicable.
	10X Reaction Buffer	Not applicable.
	Dpn I	Not applicable.
	Control Primer 1 (34-mer)	Not applicable.
	Control Primer 2 (34-mer)	Not applicable.
	pWS4.5 Control Template	Not applicable.
	QuikChange XL dNTP Mix	Not applicable.
	XL10-Gold Ultracompetent cells	Not applicable.
	XL10-Gold	Not applicable.
	2-Mercaptoethanol	
	pUC 18 DNA Control Plasmid	Not applicable.

**Special packaging requirements**

<b>Tactile warning of danger</b>	QuikSolution	Not applicable.
	PfuUltra HF DNA Polymerase	Not applicable.
	10X Reaction Buffer	Not applicable.
	Dpn I	Not applicable.
	Control Primer 1 (34-mer)	Not applicable.
	Control Primer 2 (34-mer)	Not applicable.
	pWS4.5 Control Template	Not applicable.
	QuikChange XL dNTP Mix	Not applicable.
	XL10-Gold Ultracompetent cells	Not applicable.
	XL10-Gold	Not applicable.
	2-Mercaptoethanol	
	pUC 18 DNA Control Plasmid	Not applicable.

**2.3 Other hazards**

<b>Other hazards which do not result in classification</b>	QuikSolution	None known.
	PfuUltra HF DNA Polymerase	None known.
	10X Reaction Buffer	None known.
	Dpn I	None known.
	Control Primer 1 (34-mer)	None known.
	Control Primer 2 (34-mer)	None known.
	pWS4.5 Control Template	None known.
	QuikChange XL dNTP Mix	None known.
	XL10-Gold Ultracompetent cells	None known.
	XL10-Gold	None known.
	2-Mercaptoethanol	
	pUC 18 DNA Control Plasmid	None known.

**SECTION 3: Composition/information on ingredients**

<b>3.2 Mixtures</b>	: QuikSolution	Mono-constituent substance
	PfuUltra HF DNA Polymerase	Mixture
	10X Reaction Buffer	Mixture
	Dpn I	Mixture
	Control Primer 1 (34-mer)	Mixture
	Control Primer 2 (34-mer)	Mixture
	pWS4.5 Control Template	Mixture
	QuikChange XL dNTP Mix	Mixture
	XL10-Gold Ultracompetent cells	Mixture
	XL10-Gold 2-Mercaptoethanol	Mixture
	pUC 18 DNA Control Plasmid	Mixture

Product/ingredient name	Identifiers	%	Regulation (EC) No. 1272/2008 [CLP]	Type
<b>QuikSolution</b> Dimethyl sulfoxide	EC: 200-664-3 CAS: 67-68-5	100	Not classified.	[A]
<b>PfuUltra HF DNA Polymerase</b> Glycerol	EC: 200-289-5 CAS: 56-81-5	≥50 - ≤75	Not classified.	[2]
Poly(oxy-1,2-ethanediyl), .alpha.-[(1,1,3,3-tetramethylbutyl)phenyl]-.omega.-hydroxy-	CAS: 9036-19-5	≤0.3	Skin Irrit. 2, H315 Eye Dam. 1, H318 Aquatic Chronic 2, H411	[1] [5]
<b>10X Reaction Buffer</b> 2-Amino-2-(hydroxymethyl)propane-1,3-diol hydrochloride	EC: 214-684-5 CAS: 1185-53-1	≤5	Skin Irrit. 2, H315 Eye Irrit. 2, H319 STOT SE 3, H335	[1]
Polyoxyethylene octyl phenyl ether	CAS: 9002-93-1	≤2.3	Acute Tox. 4, H302 Skin Irrit. 2, H315 Eye Dam. 1, H318 Aquatic Chronic 2, H411	[1] [5]
<b>Dpn I</b> Glycerol	EC: 200-289-5 CAS: 56-81-5	≥50 - ≤75	Not classified.	[2]
Sodium chloride	EC: 231-598-3 CAS: 7647-14-5	≤3	Eye Irrit. 2, H319	[1]
<b>XL10-Gold Ultracompetent cells</b> Glycerol	EC: 200-289-5 CAS: 56-81-5	≥10 - ≤25	Not classified.	[2]
Sucrose	EC: 200-334-9 CAS: 57-50-1	≤10	Not classified.	[2]
<b>XL10-Gold 2-Mercaptoethanol</b> Sodium chloride	EC: 231-598-3 CAS: 7647-14-5	≥10 - ≤25	Eye Irrit. 2, H319	[1]
2-Mercaptoethanol	EC: 200-464-6 CAS: 60-24-2	≤5	Acute Tox. 3, H301 Acute Tox. 2, H310 Acute Tox. 2, H330 Skin Irrit. 2, H315 Eye Dam. 1, H318 Skin Sens. 1, H317 STOT SE 3, H335 Aquatic Chronic 2, H411	[1]
			<b>See Section 16 for the full text of the H statements declared above.</b>	

**SECTION 3: Composition/information on ingredients**

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Type

- [1] Substance classified with a health or environmental hazard
- [2] Substance with a workplace exposure limit
- [3] Substance meets the criteria for PBT according to Regulation (EC) No. 1907/2006, Annex XIII
- [4] Substance meets the criteria for vPvB according to Regulation (EC) No. 1907/2006, Annex XIII
- [5] Substance of equivalent concern
- [A] Constituent
- [B] Impurity
- [C] Stabilising additive

**SECTION 4: First aid measures****4.1 Description of 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. Get medical attention if irritation occurs.
	PfuUltra HF DNA Polymerase	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.
	10X Reaction Buffer	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. Get medical attention.
	Dpn I	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.
	Control Primer 1 (34-mer)	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.
	Control Primer 2 (34-mer)	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.
	pWS4.5 Control Template	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. Check for and remove any contact lenses. Get medical attention if irritation occurs.
	XL10-Gold Ultracompetent cells	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.
	XL10-Gold 2-Mercaptoethanol	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.
	pUC 18 DNA Control Plasmid	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.
<b>Inhalation</b>	: QuikSolution	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.
	PfuUltra HF DNA Polymerase	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.
	10X Reaction Buffer	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-



**SECTION 4: First aid measures**

	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. 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	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.
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.
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.
XL10-Gold Ultracompetent cells	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.
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, belt or waistband.
pUC 18 DNA Control Plasmid	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.
<b>Skin contact</b>	
: QuikSolution	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
PfuUltra HF DNA Polymerase	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
10X Reaction Buffer	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.
Dpn I	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.
pWS4.5 Control	Flush contaminated skin with plenty of water. Remove



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	Template	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.
	XL10-Gold Ultracompetent cells	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
	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.
<b>Ingestion</b>	: QuikSolution	Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. 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.
	PfuUltra HF DNA Polymerase	Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. 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.
	10X Reaction Buffer	Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. 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.
	Dpn I	Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. 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. Remove victim to fresh air and keep at rest in a position comfortable for breathing. 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. Remove victim to fresh air and keep at rest in a position comfortable for breathing. 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.

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pWS4.5 Control Template	Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. 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. Remove victim to fresh air and keep at rest in a position comfortable for breathing. 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.
XL10-Gold Ultracompetent cells	Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. 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.
XL10-Gold 2-Mercaptoethanol	Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. 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.
pUC 18 DNA Control Plasmid	Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. 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.
<b>Protection of first-aiders</b> : QuikSolution	No action shall be taken involving any personal risk or without suitable training.
PfuUltra HF DNA Polymerase	No action shall be taken involving any personal risk or without suitable training.
10X Reaction Buffer	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.
Dpn I	No action shall be taken involving any personal risk or without suitable training.
Control Primer 1 (34-mer)	No action shall be taken involving any personal risk or without suitable training.
Control Primer 2 (34-mer)	No action shall be taken involving any personal risk or without suitable training.
pWS4.5 Control Template	No action shall be taken involving any personal risk or without suitable training.
QuikChange XL dNTP Mix	No action shall be taken involving any personal risk or without suitable training.
XL10-Gold Ultracompetent cells	No action shall be taken involving any personal risk or without suitable training.
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

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pUC 18 DNA Control Plasmid	water before removing it, or wear gloves. No action shall be taken involving any personal risk or without suitable training.
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**4.2 Most important symptoms and effects, both acute and delayed****Potential acute health effects**

<b>Eye contact</b>	: QuikSolution PfuUltra HF DNA Polymerase 10X Reaction Buffer Dpn I Control Primer 1 (34-mer) Control Primer 2 (34-mer) pWS4.5 Control Template QuikChange XL dNTP Mix 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. Causes serious eye irritation. 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. Causes serious eye damage. No known significant effects or critical hazards.
<b>Inhalation</b>	: QuikSolution PfuUltra HF DNA Polymerase 10X Reaction Buffer Dpn I Control Primer 1 (34-mer) Control Primer 2 (34-mer) pWS4.5 Control Template QuikChange XL dNTP Mix 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. No known significant effects or critical hazards. No known significant effects or critical hazards.
<b>Skin contact</b>	: QuikSolution PfuUltra HF DNA Polymerase 10X Reaction Buffer Dpn I Control Primer 1 (34-mer) Control Primer 2 (34-mer) pWS4.5 Control Template QuikChange XL dNTP Mix 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.

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<b>Ingestion</b>	:	QuikSolution	No known significant effects or critical hazards.
		PfuUltra HF DNA Polymerase	No known significant effects or critical hazards.
		10X Reaction Buffer	No known significant effects or critical hazards.
		Dpn I	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.
		pWS4.5 Control Template	No known significant effects or critical hazards.
		QuikChange XL dNTP Mix	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.

**Over-exposure signs/symptoms**

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

<b>Inhalation</b>	:	QuikSolution	No specific data.
		PfuUltra HF DNA Polymerase	No specific data.
		10X Reaction Buffer	No specific data.
		Dpn I	No specific data.
		Control Primer 1 (34-mer)	No specific data.
		Control Primer 2 (34-mer)	No specific data.
		pWS4.5 Control Template	No specific data.
		QuikChange XL dNTP Mix	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.

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<b>Skin contact</b>	:	QuikSolution	No specific data.		
		PfuUltra HF DNA Polymerase	No specific data.		
		10X Reaction Buffer	No specific data.		
		Dpn I	No specific data.		
		Control Primer 1 (34-mer)	No specific data.		
		Control Primer 2 (34-mer)	No specific data.		
		pWS4.5 Control Template	No specific data.		
		QuikChange XL dNTP Mix	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		
		pUC 18 DNA Control Plasmid	No specific data.		
		<b>Ingestion</b>	:	QuikSolution	No specific data.
				PfuUltra HF DNA Polymerase	No specific data.
				10X Reaction Buffer	No specific data.
Dpn I	No specific data.				
Control Primer 1 (34-mer)	No specific data.				
Control Primer 2 (34-mer)	No specific data.				
pWS4.5 Control Template	No specific data.				
QuikChange XL dNTP Mix	No specific data.				
XL10-Gold Ultracompetent cells	No specific data.				
XL10-Gold 2-Mercaptoethanol	Adverse symptoms may include the following:  stomach pains				
pUC 18 DNA Control Plasmid	No specific data.				

### 4.3 Indication of any immediate medical attention and special treatment needed

<b>Notes to physician</b>	:	QuikSolution	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
		PfuUltra HF DNA Polymerase	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
		10X Reaction 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 surveillance for 48 hours.
		Dpn I	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.
		pWS4.5 Control Template	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
		QuikChange XL dNTP Mix	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.
		XL10-Gold	Treat symptomatically. Contact poison treatment specialist

## SECTION 4: First aid measures

	Ultracompetent cells	immediately if large quantities have been ingested or inhaled.
	XL10-Gold	Treat symptomatically. Contact poison treatment specialist
	2-Mercaptoethanol	immediately if large quantities have been ingested or inhaled.
	pUC 18 DNA Control	Treat symptomatically. Contact poison treatment specialist
	Plasmid	immediately if large quantities have been ingested or inhaled.
<b>Specific treatments</b>	: QuikSolution	No specific treatment.
	PfuUltra HF DNA	No specific treatment.
	Polymerase	
	10X Reaction Buffer	No specific treatment.
	Dpn I	No specific treatment.
	Control Primer 1	No specific treatment.
	(34-mer)	
	Control Primer 2	No specific treatment.
	(34-mer)	
	pWS4.5 Control	No specific treatment.
	Template	
	QuikChange XL dNTP	No specific treatment.
	Mix	
	XL10-Gold	No specific treatment.
	Ultracompetent cells	
	XL10-Gold	No specific treatment.
	2-Mercaptoethanol	
	pUC 18 DNA Control	No specific treatment.
	Plasmid	

## SECTION 5: Firefighting measures

### 5.1 Extinguishing media

<b>Suitable extinguishing media</b>	: QuikSolution	Use an extinguishing agent suitable for the surrounding fire.
	PfuUltra HF DNA	Use an extinguishing agent suitable for the surrounding fire.
	Polymerase	
	10X Reaction Buffer	Use an extinguishing agent suitable for the surrounding fire.
	Dpn I	Use an extinguishing agent suitable for the surrounding fire.
	Control Primer 1	Use an extinguishing agent suitable for the surrounding fire.
	(34-mer)	
	Control Primer 2	Use an extinguishing agent suitable for the surrounding fire.
	(34-mer)	
	pWS4.5 Control	Use an extinguishing agent suitable for the surrounding fire.
	Template	
	QuikChange XL dNTP	Use an extinguishing agent suitable for the surrounding fire.
	Mix	
	XL10-Gold	Use an extinguishing agent suitable for the surrounding fire.
	Ultracompetent cells	
	XL10-Gold	Use an extinguishing agent suitable for the surrounding fire.
	2-Mercaptoethanol	
	pUC 18 DNA Control	Use an extinguishing agent suitable for the surrounding fire.
	Plasmid	
<b>Unsuitable extinguishing media</b>	: QuikSolution	None known.
	PfuUltra HF DNA	None known.
	Polymerase	
	10X Reaction Buffer	None known.
	Dpn I	None known.
	Control Primer 1	None known.
	(34-mer)	
	Control Primer 2	None known.
	(34-mer)	
	pWS4.5 Control	None known.
	Template	
	QuikChange XL dNTP	None known.
	Mix	
	XL10-Gold	None known.
	Ultracompetent cells	
	XL10-Gold	None known.
	2-Mercaptoethanol	



**SECTION 5: Firefighting measures**

pUC 18 DNA Control Plasmid      None known.

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

**Hazards from the substance or mixture**

: QuikSolution      In a fire or if heated, a pressure increase will occur and the container may burst.

PfuUltra HF DNA Polymerase      In a fire or if heated, a pressure increase will occur and the container may burst.

10X Reaction Buffer      In a fire or if heated, a pressure increase will occur and the container may burst.

Dpn I      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.

pWS4.5 Control Template      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.

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.

**Hazardous combustion products**

pUC 18 DNA Control Plasmid      In a fire or if heated, a pressure increase will occur and the container may burst.

: QuikSolution      Decomposition products may include the following materials:  
carbon dioxide  
carbon monoxide  
sulfur oxides

PfuUltra HF DNA Polymerase      Decomposition products may include the following materials:  
carbon dioxide  
carbon monoxide

10X Reaction Buffer      Decomposition products may include the following materials:  
carbon dioxide  
carbon monoxide  
nitrogen oxides  
sulfur oxides  
halogenated compounds

Dpn I      Decomposition products may include the following materials:  
carbon dioxide  
carbon monoxide  
halogenated compounds  
metal oxide/oxides

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

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

pWS4.5 Control Template      No specific data.

QuikChange XL dNTP Mix      Decomposition products may include the following materials:  
carbon dioxide  
carbon monoxide  
nitrogen oxides  
phosphorus oxides

XL10-Gold Ultracompetent cells      Decomposition products may include the following materials:  
carbon dioxide



**SECTION 5: Firefighting measures**

XL10-Gold 2-Mercaptoethanol	carbon monoxide sulfur oxides halogenated compounds metal oxide/oxides Decomposition products may include the following materials:
pUC 18 DNA Control Plasmid	carbon dioxide carbon monoxide sulfur oxides halogenated compounds metal oxide/oxides No specific data.

**5.3 Advice for firefighters**

**Special precautions 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.
PfuUltra HF DNA Polymerase	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 Reaction 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.
Dpn I	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.
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.
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.
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 without suitable training.
XL10-Gold 2-Mercaptoethanol	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.

**Special protective equipment for fire-fighters**

: QuikSolution	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.
PfuUltra HF DNA Polymerase	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.
10X Reaction Buffer	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for

## SECTION 5: Firefighting measures

Dpn I	fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents. Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.
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. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.
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. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.
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. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.
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. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.
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. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.
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. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.
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. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.

## SECTION 6: Accidental release measures

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

<b>For non-emergency personnel</b>	: 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 spilt material. Put on appropriate personal protective equipment.
	PfuUltra HF DNA Polymerase	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 spilt material. Put on

**SECTION 6: Accidental release measures**

10X Reaction Buffer	appropriate personal protective equipment. 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 spilt material. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
Dpn I	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 spilt 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 spilt 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 spilt material. 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 spilt 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 spilt material. Put on appropriate personal protective equipment.
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 spilt material. 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 spilt material. Do not breathe vapour 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 spilt material. Put on appropriate personal protective equipment.
<b>For emergency responders</b> : QuikSolution	If specialised 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".
PfuUltra HF DNA Polymerase	If specialised 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 Reaction Buffer	If specialised 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	If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and

**SECTION 6: Accidental release measures**

Control Primer 1 (34-mer)	unsuitable materials. See also the information in "For non-emergency personnel". If specialised 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 specialised 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 specialised 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 specialised 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 specialised 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 2-Mercaptoethanol	If specialised 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 specialised 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".

**6.2 Environmental precautions**

: QuikSolution	Avoid dispersal of spilt 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).
PfuUltra HF DNA Polymerase	Avoid dispersal of spilt 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 Reaction Buffer	Avoid dispersal of spilt 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	Avoid dispersal of spilt 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 spilt 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 spilt 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 spilt 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 spilt 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	Avoid dispersal of spilt material and runoff and contact with

**SECTION 6: Accidental release measures**

Ultracompetent cells	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 spilt 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 large quantities.
pUC 18 DNA Control Plasmid	Avoid dispersal of spilt 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 material for containment and cleaning up**

<b>Methods for cleaning up</b> : QuikSolution	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.
PfuUltra HF DNA Polymerase	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 Reaction 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.
Dpn I	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.
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.
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.
XL10-Gold Ultracompetent cells	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 2-Mercaptoethanol	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



## SECTION 6: Accidental release measures

pUC 18 DNA Control Plasmid	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.
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**6.4 Reference to other sections** : See Section 1 for emergency contact information.  
See Section 8 for information on appropriate personal protective equipment.  
See Section 13 for additional waste treatment information.

## SECTION 7: Handling and storage

### 7.1 Precautions for safe handling

<b>Protective measures</b>	: QuikSolution	Put on appropriate personal protective equipment (see Section 8).
PfuUltra HF DNA Polymerase		Put on appropriate personal protective equipment (see Section 8).
10X Reaction Buffer		Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapour 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.
Dpn I		Put on appropriate personal protective equipment (see Section 8).
Control Primer 1 (34-mer)		Put on appropriate personal protective equipment (see Section 8).
Control Primer 2 (34-mer)		Put on appropriate personal protective equipment (see Section 8).
pWS4.5 Control Template		Put on appropriate personal protective equipment (see Section 8).
QuikChange XL dNTP Mix		Put on appropriate personal protective equipment (see Section 8).
XL10-Gold Ultracompetent cells		Put on appropriate personal protective equipment (see Section 8).
XL10-Gold 2-Mercaptoethanol		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. Do not get in eyes or on skin or clothing. Do not breathe vapour 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.
pUC 18 DNA Control Plasmid		Put on appropriate personal protective equipment (see Section 8).
<b>Advice on general occupational hygiene</b>	: QuikSolution	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.
	PfuUltra HF DNA Polymerase	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.

**SECTION 7: Handling and storage**

10X Reaction Buffer	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.
Dpn I	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.
pWS4.5 Control Template	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.
QuikChange XL dNTP Mix	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**



**SECTION 7: Handling and storage****Storage**

: QuikSolution

Storage temperature: -20°C (-4°F). 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 unlabelled containers. Use appropriate containment to avoid environmental contamination.

PfuUltra HF DNA  
Polymerase

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 unlabelled containers. Use appropriate containment to avoid environmental contamination.

10X Reaction Buffer

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 unlabelled containers. Use appropriate containment to avoid environmental contamination.

Dpn I

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 unlabelled containers. Use appropriate containment to avoid environmental contamination.

Control Primer 1  
(34-mer)

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 unlabelled containers. Use appropriate containment to avoid environmental contamination.

Control Primer 2  
(34-mer)

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 unlabelled containers. Use appropriate containment to avoid environmental contamination.

pWS4.5 Control  
Template

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 unlabelled containers. Use appropriate containment to avoid environmental contamination.

QuikChange XL dNTP

Store in accordance with local regulations. Store in original

## SECTION 7: Handling and storage

Mix	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 unlabelled containers. Use appropriate containment to avoid environmental contamination.
XL10-Gold Ultracompetent cells	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 unlabelled containers. Use appropriate containment to avoid environmental contamination.
XL10-Gold 2-Mercaptoethanol	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 unlabelled containers. Use appropriate containment to avoid environmental contamination.
pUC 18 DNA Control Plasmid	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 unlabelled containers. Use appropriate containment to avoid environmental contamination.

### 7.3 Specific end use(s)

#### Recommendations

QuikSolution	Industrial applications, Professional applications.
PfuUltra HF DNA Polymerase	Industrial applications, Professional applications.
10X Reaction Buffer	Industrial applications, Professional applications.
Dpn I	Industrial applications, Professional applications.
Control Primer 1 (34-mer)	Industrial applications, Professional applications.
Control Primer 2 (34-mer)	Industrial applications, Professional applications.
pWS4.5 Control Template	Industrial applications, Professional applications.
QuikChange XL dNTP Mix	Industrial applications, Professional applications.
XL10-Gold Ultracompetent cells	Industrial applications, Professional applications.
XL10-Gold 2-Mercaptoethanol	Industrial applications, Professional applications.
pUC 18 DNA Control Plasmid	Industrial applications, Professional applications.

#### Industrial sector specific solutions

QuikSolution	Not applicable.
PfuUltra HF DNA Polymerase	Not applicable.
10X Reaction Buffer	Not applicable.
Dpn I	Not applicable.
Control Primer 1 (34-mer)	Not applicable.

## SECTION 7: Handling and storage

Control Primer 2 (34-mer)	Not applicable.
pWS4.5 Control Template	Not applicable.
QuikChange XL dNTP Mix	Not applicable.
XL10-Gold Ultracompetent cells	Not applicable.
XL10-Gold 2-Mercaptoethanol	Not applicable.
pUC 18 DNA Control Plasmid	Not applicable.

## SECTION 8: Exposure controls/personal protection

### 8.1 Control parameters

#### Occupational exposure limits

Product/ingredient name	Exposure limit values
<b>PfuUltra HF DNA Polymerase</b> Glycerol	<b>EH40/2005 WELs (United Kingdom (UK), 12/2011).</b> TWA: 10 mg/m <sup>3</sup> 8 hours. Form: Mist
<b>Dpn I</b> Glycerol	<b>EH40/2005 WELs (United Kingdom (UK), 12/2011).</b> TWA: 10 mg/m <sup>3</sup> 8 hours. Form: Mist
<b>XL10-Gold Ultracompetent cells</b> Glycerol	<b>EH40/2005 WELs (United Kingdom (UK), 12/2011).</b> TWA: 10 mg/m <sup>3</sup> 8 hours. Form: Mist
Sucrose	<b>EH40/2005 WELs (United Kingdom (UK), 12/2011).</b> STEL: 20 mg/m <sup>3</sup> 15 minutes. TWA: 10 mg/m <sup>3</sup> 8 hours.

#### Recommended monitoring procedures

: If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to monitoring standards, such as the following: European Standard EN 689 (Workplace atmospheres - Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy) European Standard EN 14042 (Workplace atmospheres - Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents) European Standard EN 482 (Workplace atmospheres - General requirements for the performance of procedures for the measurement of chemical agents) Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

#### DNELs/DMELs

No DNELs/DMELs available.

#### PNECs

No PNECs available

### 8.2 Exposure controls

**Appropriate engineering controls** : If user operations generate dust, fumes, gas, vapour or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

#### Individual protection measures

## SECTION 8: Exposure controls/personal protection

- Hygiene measures** : Handle as biohazard material (Biosafety level 1). Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.
- Eye/face protection** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles and/or face shield. If inhalation hazards exist, a full-face respirator may be required instead.
- Skin 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.
- Environmental exposure controls** : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

## SECTION 9: Physical and chemical properties

### 9.1 Information on basic physical and chemical properties

#### Appearance

<b>Physical state</b>	: QuikSolution	Liquid. [Clear.]
	PfuUltra HF DNA Polymerase	Liquid.
	10X Reaction Buffer	Liquid.
	Dpn I	Liquid.
	Control Primer 1 (34-mer)	Liquid.
	Control Primer 2 (34-mer)	Liquid.
	pWS4.5 Control Template	Liquid.
	QuikChange XL dNTP Mix	Liquid.
	XL10-Gold Ultracompetent cells	Liquid.
	XL10-Gold 2-Mercaptoethanol	Liquid.
	pUC 18 DNA Control Plasmid	Liquid.



**SECTION 9: Physical and chemical properties**

<b>pH</b>	:	QuikSolution	Not available.	
		PfuUltra HF DNA Polymerase	8.2	
		10X Reaction Buffer	8.8	
		Dpn I	Not available.	
		Control Primer 1 (34-mer)	7.5	
		Control Primer 2 (34-mer)	7.5	
		pWS4.5 Control Template	7.5	
		QuikChange XL dNTP Mix	7.5	
		XL10-Gold Ultracompetent cells	6.4	
		XL10-Gold	Not available.	
		2-Mercaptoethanol		
		pUC 18 DNA Control Plasmid	7.5	
	<b>Melting point/freezing point</b>	:	QuikSolution	18.4°C
			PfuUltra HF DNA Polymerase	Not available.
			10X Reaction Buffer	Not available.
			Dpn I	Not available.
			Control Primer 1 (34-mer)	0°C
		Control Primer 2 (34-mer)	0°C	
		pWS4.5 Control Template	0°C	
		QuikChange XL dNTP Mix	Not available.	
		XL10-Gold Ultracompetent cells	Not available.	
		XL10-Gold	Not available.	
		2-Mercaptoethanol		
		pUC 18 DNA Control Plasmid	0°C	
<b>Initial boiling point and boiling range</b>		:	QuikSolution	188.8°C
			PfuUltra HF DNA Polymerase	Not available.
			10X Reaction Buffer	Not available.
			Dpn I	Not available.
			Control Primer 1 (34-mer)	100°C
		Control Primer 2 (34-mer)	100°C	
		pWS4.5 Control Template	100°C	
		QuikChange XL dNTP Mix	Not available.	
		XL10-Gold Ultracompetent cells	Not available.	
		XL10-Gold	Not available.	
		2-Mercaptoethanol		
		pUC 18 DNA Control Plasmid	100°C	

**SECTION 9: Physical and chemical properties**

<b>Flash point</b>	:	QuikSolution	Closed cup: 85°C		
			Open cup: 87°C		
		PfuUltra HF DNA Polymerase	Not available.		
		10X Reaction Buffer	Not available.		
		Dpn I	Not available.		
		Control Primer 1 (34-mer)	Not available.		
		Control Primer 2 (34-mer)	Not available.		
		pWS4.5 Control Template	Not available.		
		QuikChange XL dNTP Mix	Not available.		
		XL10-Gold Ultracompetent cells	Not available.		
		XL10-Gold	Not available.		
		2-Mercaptoethanol	Not available.		
		pUC 18 DNA Control Plasmid	Not available.		
		<b>Evaporation rate</b>	:	QuikSolution	0.026 (butyl acetate = 1)
				PfuUltra HF DNA Polymerase	Not available.
				10X Reaction Buffer	Not available.
Dpn I	Not available.				
Control Primer 1 (34-mer)	Not available.				
Control Primer 2 (34-mer)	Not available.				
pWS4.5 Control Template	Not available.				
QuikChange XL dNTP Mix	Not available.				
XL10-Gold Ultracompetent cells	Not available.				
XL10-Gold	Not available.				
2-Mercaptoethanol	Not available.				
pUC 18 DNA Control Plasmid	Not available.				
<b>Flammability (solid, gas)</b>	:			QuikSolution	Not applicable.
				PfuUltra HF DNA Polymerase	Not applicable.
				10X Reaction Buffer	Not applicable.
				Dpn I	Not applicable.
		Control Primer 1 (34-mer)	Not applicable.		
		Control Primer 2 (34-mer)	Not applicable.		
		pWS4.5 Control Template	Not applicable.		
		QuikChange XL dNTP Mix	Not applicable.		
		XL10-Gold Ultracompetent cells	Not applicable.		
		XL10-Gold	Not applicable.		
		2-Mercaptoethanol	Not applicable.		
		pUC 18 DNA Control Plasmid	Not applicable.		



**SECTION 9: Physical and chemical properties**

<b>Upper/lower flammability or explosive limits</b>	<b>:</b>	QuikSolution	Lower: 2.6%	
			Upper: 42%	
		PfuUltra HF DNA Polymerase	Not available.	
		10X Reaction Buffer	Not available.	
		Dpn I	Not available.	
		Control Primer 1 (34-mer)	Not available.	
		Control Primer 2 (34-mer)	Not available.	
		pWS4.5 Control Template	Not available.	
		QuikChange XL dNTP Mix	Not available.	
		XL10-Gold Ultracompetent cells	Not available.	
		XL10-Gold	Not available.	
		2-Mercaptoethanol		
		pUC 18 DNA Control Plasmid	Not available.	
	<b>Vapour pressure</b>	<b>:</b>	QuikSolution	0.056 kPa [room temperature]
			PfuUltra HF DNA Polymerase	Not available.
			10X Reaction Buffer	Not available.
		Dpn I	Not available.	
		Control Primer 1 (34-mer)	Not available.	
		Control Primer 2 (34-mer)	Not available.	
		pWS4.5 Control Template	Not available.	
		QuikChange XL dNTP Mix	Not available.	
		XL10-Gold Ultracompetent cells	Not available.	
		XL10-Gold	Not available.	
		2-Mercaptoethanol		
		pUC 18 DNA Control Plasmid	Not available.	
<b>Vapour density</b>		<b>:</b>	QuikSolution	2.71 [Air = 1]
			PfuUltra HF DNA Polymerase	Not available.
			10X Reaction Buffer	Not available.
			Dpn I	Not available.
		Control Primer 1 (34-mer)	Not available.	
		Control Primer 2 (34-mer)	Not available.	
		pWS4.5 Control Template	Not available.	
		QuikChange XL dNTP Mix	Not available.	
		XL10-Gold Ultracompetent cells	Not available.	
		XL10-Gold	Not available.	
		2-Mercaptoethanol		
		pUC 18 DNA Control Plasmid	Not available.	

**SECTION 9: Physical and chemical properties**

<b>Relative density</b>	:	QuikSolution	1.1
		PfuUltra HF DNA Polymerase	Not available.
		10X Reaction Buffer	Not available.
		Dpn I	Not available.
		Control Primer 1 (34-mer)	Not available.
		Control Primer 2 (34-mer)	Not available.
		pWS4.5 Control Template	Not available.
		QuikChange XL dNTP Mix	Not available.
		XL10-Gold Ultracompetent cells	Not available.
		XL10-Gold	Not available.
		2-Mercaptoethanol	Not available.
		pUC 18 DNA Control Plasmid	Not available.
<b>Solubility(ies)</b>	:	QuikSolution	Easily soluble in the following materials: cold water and hot water.
		PfuUltra HF DNA Polymerase	Soluble in the following materials: cold water and hot water.
		10X Reaction Buffer	Easily soluble in the following materials: cold water and hot water.
		Dpn I	Soluble in the following materials: cold water and hot water.
		Control Primer 1 (34-mer)	Easily soluble in the following materials: cold water and hot water.
		Control Primer 2 (34-mer)	Easily soluble in the following materials: cold water and hot water.
		pWS4.5 Control Template	Easily soluble in the following materials: cold water and hot water.
		QuikChange XL dNTP Mix	Easily soluble in the following materials: cold water and hot water.
		XL10-Gold Ultracompetent cells	Soluble in the following materials: cold water and hot water.
		XL10-Gold	Easily soluble in the following materials: cold water and hot water.
		2-Mercaptoethanol	Easily soluble in the following materials: cold water and hot water.
		pUC 18 DNA Control Plasmid	Easily soluble in the following materials: cold water and hot water.
<b>Partition coefficient: n-octanol/water</b>	:	QuikSolution	-2.029
		PfuUltra HF DNA Polymerase	Not available.
		10X Reaction Buffer	Not available.
		Dpn I	Not available.
		Control Primer 1 (34-mer)	Not available.
		Control Primer 2 (34-mer)	Not available.
		pWS4.5 Control Template	Not available.
		QuikChange XL dNTP Mix	Not available.
		XL10-Gold Ultracompetent cells	Not available.
		XL10-Gold	Not available.
		2-Mercaptoethanol	Not available.
		pUC 18 DNA Control Plasmid	Not available.

**SECTION 9: Physical and chemical properties**

<b>Auto-ignition temperature</b>	:	QuikSolution	300 to 302°C
		PfuUltra HF DNA Polymerase	Not available.
		10X Reaction Buffer	Not available.
		Dpn I	Not available.
		Control Primer 1 (34-mer)	Not available.
		Control Primer 2 (34-mer)	Not available.
		pWS4.5 Control Template	Not available.
		QuikChange XL dNTP Mix	Not available.
		XL10-Gold Ultracompetent cells	Not available.
		XL10-Gold	Not available.
		2-Mercaptoethanol	Not available.
		pUC 18 DNA Control Plasmid	Not available.
<b>Decomposition temperature</b>	:	QuikSolution	140 to 189°C
		PfuUltra HF DNA Polymerase	Not available.
		10X Reaction Buffer	Not available.
		Dpn I	Not available.
		Control Primer 1 (34-mer)	Not available.
		Control Primer 2 (34-mer)	Not available.
		pWS4.5 Control Template	Not available.
		QuikChange XL dNTP Mix	Not available.
		XL10-Gold Ultracompetent cells	Not available.
		XL10-Gold	Not available.
		2-Mercaptoethanol	Not available.
		pUC 18 DNA Control Plasmid	Not available.
<b>Viscosity</b>	:	QuikSolution	Dynamic (room temperature): 2.14 mPa·s
		PfuUltra HF DNA Polymerase	Not available.
		10X Reaction Buffer	Not available.
		Dpn I	Not available.
		Control Primer 1 (34-mer)	Not available.
		Control Primer 2 (34-mer)	Not available.
		pWS4.5 Control Template	Not available.
		QuikChange XL dNTP Mix	Not available.
		XL10-Gold Ultracompetent cells	Not available.
		XL10-Gold	Not available.
		2-Mercaptoethanol	Not available.
		pUC 18 DNA Control Plasmid	Not available.

**SECTION 9: Physical and chemical properties**

<b>Explosive properties</b>	:	QuikSolution	Not available.	
		PfuUltra HF DNA Polymerase	Not available.	
		10X Reaction Buffer	Not available.	
		Dpn I	Not available.	
		Control Primer 1 (34-mer)	Not available.	
		Control Primer 2 (34-mer)	Not available.	
		pWS4.5 Control Template	Not available.	
		QuikChange XL dNTP Mix	Not available.	
		XL10-Gold Ultracompetent cells	Not available.	
		XL10-Gold	Not available.	
		2-Mercaptoethanol	Not available.	
		pUC 18 DNA Control Plasmid	Not available.	
	<b>Oxidising properties</b>	:	QuikSolution	Not available.
			PfuUltra HF DNA Polymerase	Not available.
			10X Reaction Buffer	Not available.
			Dpn I	Not available.
			Control Primer 1 (34-mer)	Not available.
			Control Primer 2 (34-mer)	Not available.
			pWS4.5 Control Template	Not available.
		QuikChange XL dNTP Mix	Not available.	
		XL10-Gold Ultracompetent cells	Not available.	
		XL10-Gold	Not available.	
		2-Mercaptoethanol	Not available.	
		pUC 18 DNA Control Plasmid	Not available.	

**9.2 Other information**

No additional information.

**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.
		PfuUltra HF DNA Polymerase	No specific test data related to reactivity available for this product or its ingredients.
		10X Reaction Buffer	No specific test data related to reactivity available for this product or its ingredients.
		Dpn I	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.
		pWS4.5 Control Template	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.
		XL10-Gold Ultracompetent cells	No specific test data related to reactivity available for this product or its ingredients.
		XL10-Gold	No specific test data related to reactivity available for this product or its ingredients.
		2-Mercaptoethanol	No specific test data related to reactivity available for this product or its ingredients.

**SECTION 10: Stability and reactivity**

pUC 18 DNA Control Plasmid No specific test data related to reactivity available for this product or its ingredients.

**10.2 Chemical stability**

: QuikSolution The product is stable.  
 PfuUltra HF DNA Polymerase The product is stable.  
 10X Reaction Buffer The product is stable.  
 Dpn I The product is stable.  
 Control Primer 1 (34-mer) The product is stable.  
 Control Primer 2 (34-mer) The product is stable.  
 pWS4.5 Control Template The product is stable.  
 QuikChange XL dNTP Mix The product is stable.  
 XL10-Gold Ultracompetent cells The product is stable.  
 XL10-Gold The product is stable.  
 2-Mercaptoethanol pUC 18 DNA Control Plasmid The product is stable.

**10.3 Possibility of hazardous reactions**

: QuikSolution Under normal conditions of storage and use, hazardous reactions will not occur.  
 PfuUltra HF DNA Polymerase Under normal conditions of storage and use, hazardous reactions will not occur.  
 10X Reaction Buffer Under normal conditions of storage and use, hazardous reactions will not occur.  
 Dpn I Under normal conditions of storage and use, hazardous reactions will not occur.  
 Control Primer 1 (34-mer) Under normal conditions of storage and use, hazardous reactions will not occur.  
 Control Primer 2 (34-mer) Under normal conditions of storage and use, hazardous reactions will not occur.  
 pWS4.5 Control Template 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.  
 XL10-Gold Ultracompetent cells Under normal conditions of storage and use, hazardous reactions will not occur.  
 XL10-Gold Under normal conditions of storage and use, hazardous reactions will not occur.  
 2-Mercaptoethanol pUC 18 DNA Control Plasmid Under normal conditions of storage and use, hazardous reactions will not occur.

**10.4 Conditions to avoid**

: QuikSolution No specific data.  
 PfuUltra HF DNA Polymerase No specific data.  
 10X Reaction Buffer No specific data.  
 Dpn I No specific data.  
 Control Primer 1 (34-mer) No specific data.  
 Control Primer 2 (34-mer) No specific data.  
 pWS4.5 Control Template No specific data.  
 QuikChange XL dNTP Mix No specific data.  
 XL10-Gold Ultracompetent cells No specific data.  
 XL10-Gold No specific data.  
 2-Mercaptoethanol No specific data.

## SECTION 10: Stability and reactivity

pUC 18 DNA Control Plasmid No specific data.

### 10.5 Incompatible materials

: QuikSolution May react or be incompatible with oxidising materials.  
 PfuUltra HF DNA Polymerase May react or be incompatible with oxidising materials.  
 10X Reaction Buffer May react or be incompatible with oxidising materials.  
 Dpn I May react or be incompatible with oxidising materials.  
 Control Primer 1 (34-mer) May react or be incompatible with oxidising materials.  
 Control Primer 2 (34-mer) May react or be incompatible with oxidising materials.  
 pWS4.5 Control Template May react or be incompatible with oxidising materials.  
 QuikChange XL dNTP Mix May react or be incompatible with oxidising materials.  
 XL10-Gold Ultracompetent cells May react or be incompatible with oxidising materials.  
 XL10-Gold May react or be incompatible with oxidising materials.  
 2-Mercaptoethanol May react or be incompatible with oxidising materials.  
 pUC 18 DNA Control Plasmid May react or be incompatible with oxidising materials.

### 10.6 Hazardous decomposition products

: QuikSolution Under normal conditions of storage and use, hazardous decomposition products should not be produced.  
 PfuUltra HF DNA Polymerase Under normal conditions of storage and use, hazardous decomposition products should not be produced.  
 10X Reaction Buffer Under normal conditions of storage and use, hazardous decomposition products should not be produced.  
 Dpn I 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.  
 pWS4.5 Control Template Under normal conditions of storage and use, hazardous decomposition products should not be produced.  
 QuikChange XL dNTP Mix 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 Under normal conditions of storage and use, hazardous decomposition products should not be produced.  
 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>PfuUltra HF DNA Polymerase</b> Poly(oxy-1,2-ethanediyl), .alpha.-[(1,1,3,3-tetramethylbutyl)phenyl]-.omega.-hydroxy-	LD50 Oral	Rat	2800 mg/kg	-
<b>Dpn I</b>				



## SECTION 11: Toxicological information

Sodium chloride	LD50 Oral	Rat	3000 mg/kg	-
<b>XL10-Gold 2-Mercaptoethanol</b>				
Sodium chloride	LD50 Oral	Rat	3000 mg/kg	-
2-Mercaptoethanol	LD50 Dermal	Rabbit	200 mg/kg	-
	LD50 Oral	Rat	244 mg/kg	-

### Acute toxicity estimates

Route	ATE value
<b>10X Reaction Buffer</b> Oral	50000 mg/kg
<b>XL10-Gold Ultracompetent cells</b> Oral	31250 mg/kg
<b>XL10-Gold 2-Mercaptoethanol</b> Oral	5545.5 mg/kg
Dermal	4545.5 mg/kg
Inhalation (vapours)	45.45 mg/l

### Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
<b>QuikSolution</b> Dimethyl sulfoxide	Eyes - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
	Eyes - Mild irritant	Rabbit	-	100 milligrams	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
	Skin - Mild irritant	Rabbit	-	100 milligrams	-
<b>PfuUltra HF DNA Polymerase</b> Poly(oxy-1,2-ethanediyl), . alpha.-[(1,1,3,3-tetramethylbutyl)phenyl]-. omega.-hydroxy-	Eyes - Severe irritant	Rabbit	-	1 Percent	-
<b>10X Reaction Buffer</b> Polyoxyethylene octyl phenyl ether	Eyes - Moderate irritant	Rabbit	-	24 hours 10 microliters	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 microliters	-
<b>Dpn I</b> Sodium chloride	Eyes - Moderate irritant	Rabbit	-	24 hours 100 milligrams	-
	Eyes - Moderate irritant	Rabbit	-	10 milligrams	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
<b>XL10-Gold 2-Mercaptoethanol</b> Sodium chloride	Eyes - Moderate irritant	Rabbit	-	24 hours 100 milligrams	-
	Eyes - Moderate irritant	Rabbit	-	10 milligrams	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
	Eyes - Severe irritant	Rabbit	-	2 milligrams	-

### Sensitiser

## SECTION 11: Toxicological information

**Conclusion/Summary** : Not available.

### Specific target organ toxicity (single exposure)

Product/ingredient name	Category	Route of exposure	Target organs
<b>10X Reaction Buffer</b> 2-Amino-2-(hydroxymethyl)propane-1,3-diol hydrochloride	Category 3	Not applicable.	Respiratory tract irritation
<b>XL10-Gold 2-Mercaptoethanol</b> 2-Mercaptoethanol	Category 3	Not applicable.	Respiratory tract irritation

### Specific target organ toxicity (repeated exposure)

Not available.

### Aspiration hazard

Not available.

### Information on likely routes of exposure

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

### Potential acute health effects

<b>Inhalation</b>	<ul style="list-style-type: none"> <li>QuikSolution: No known significant effects or critical hazards.</li> <li>PfuUltra HF DNA Polymerase: No known significant effects or critical hazards.</li> <li>10X Reaction Buffer: No known significant effects or critical hazards.</li> <li>Dpn I: No known significant effects or critical hazards.</li> <li>Control Primer 1 (34-mer): No known significant effects or critical hazards.</li> <li>Control Primer 2 (34-mer): No known significant effects or critical hazards.</li> <li>pWS4.5 Control Template: No known significant effects or critical hazards.</li> <li>QuikChange XL dNTP Mix: No known significant effects or critical hazards.</li> <li>XL10-Gold Ultracompetent cells: No known significant effects or critical hazards.</li> <li>XL10-Gold 2-Mercaptoethanol: No known significant effects or critical hazards.</li> <li>pUC 18 DNA Control Plasmid: No known significant effects or critical hazards.</li> </ul>
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**SECTION 11: Toxicological information**

<b>Ingestion</b>	:	QuikSolution	No known significant effects or critical hazards.	
		PfuUltra HF DNA Polymerase	No known significant effects or critical hazards.	
		10X Reaction Buffer	No known significant effects or critical hazards.	
		Dpn I	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.	
		pWS4.5 Control Template	No known significant effects or critical hazards.	
		QuikChange XL dNTP Mix	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.	
	<b>Skin contact</b>	:	QuikSolution	No known significant effects or critical hazards.
			PfuUltra HF DNA Polymerase	No known significant effects or critical hazards.
			10X Reaction Buffer	No known significant effects or critical hazards.
		Dpn I	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.	
		pWS4.5 Control Template	No known significant effects or critical hazards.	
		QuikChange XL dNTP Mix	No known significant effects or critical hazards.	
		XL10-Gold Ultracompetent cells	No known significant effects or critical hazards.	
		XL10-Gold 2-Mercaptoethanol	May cause an allergic skin reaction.	
		pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.	
<b>Eye contact</b>		:	QuikSolution	No known significant effects or critical hazards.
			PfuUltra HF DNA Polymerase	No known significant effects or critical hazards.
			10X Reaction Buffer	Causes serious eye irritation.
		Dpn I	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.	
		pWS4.5 Control Template	No known significant effects or critical hazards.	
		QuikChange XL dNTP Mix	No known significant effects or critical hazards.	
		XL10-Gold Ultracompetent cells	No known significant effects or critical hazards.	
		XL10-Gold 2-Mercaptoethanol	Causes serious eye damage.	
		pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.	

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

**SECTION 11: Toxicological information**

<b>Inhalation</b>	:	QuikSolution	No specific data.	
		PfuUltra HF DNA Polymerase	No specific data.	
		10X Reaction Buffer	No specific data.	
		Dpn I	No specific data.	
		Control Primer 1 (34-mer)	No specific data.	
		Control Primer 2 (34-mer)	No specific data.	
		pWS4.5 Control Template	No specific data.	
		QuikChange XL dNTP Mix	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.	
	<b>Ingestion</b>	:	QuikSolution	No specific data.
			PfuUltra HF DNA Polymerase	No specific data.
			10X Reaction Buffer	No specific data.
			Dpn I	No specific data.
			Control Primer 1 (34-mer)	No specific data.
		Control Primer 2 (34-mer)	No specific data.	
		pWS4.5 Control Template	No specific data.	
		QuikChange XL dNTP Mix	No specific data.	
		XL10-Gold Ultracompetent cells	No specific data.	
		XL10-Gold 2-Mercaptoethanol	Adverse symptoms may include the following:	
			stomach pains	
		pUC 18 DNA Control Plasmid	No specific data.	
<b>Skin contact</b>		:	QuikSolution	No specific data.
			PfuUltra HF DNA Polymerase	No specific data.
			10X Reaction Buffer	No specific data.
			Dpn I	No specific data.
		Control Primer 1 (34-mer)	No specific data.	
		Control Primer 2 (34-mer)	No specific data.	
		pWS4.5 Control Template	No specific data.	
		QuikChange XL dNTP Mix	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	
		pUC 18 DNA Control Plasmid	No specific data.	

**SECTION 11: Toxicological information**

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

**Delayed and immediate effects as well as 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.
		PfuUltra HF DNA Polymerase	No known significant effects or critical hazards.
		10X Reaction Buffer	No known significant effects or critical hazards.
		Dpn I	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.
		pWS4.5 Control Template	No known significant effects or critical hazards.
		QuikChange XL dNTP Mix	No known significant effects or critical hazards.
		XL10-Gold Ultracompetent cells	No known significant effects or critical hazards.
		XL10-Gold 2-Mercaptoethanol	Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.
		pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.

**SECTION 11: Toxicological information**

<b>Carcinogenicity</b>	:	QuikSolution	No known significant effects or critical hazards.	
		PfuUltra HF DNA Polymerase	No known significant effects or critical hazards.	
		10X Reaction Buffer	No known significant effects or critical hazards.	
		Dpn I	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.	
		pWS4.5 Control Template	No known significant effects or critical hazards.	
		QuikChange XL dNTP Mix	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.	
	<b>Mutagenicity</b>	:	QuikSolution	No known significant effects or critical hazards.
			PfuUltra HF DNA Polymerase	No known significant effects or critical hazards.
			10X Reaction Buffer	No known significant effects or critical hazards.
		Dpn I	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.	
		pWS4.5 Control Template	No known significant effects or critical hazards.	
		QuikChange XL dNTP Mix	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.	
<b>Teratogenicity</b>		:	QuikSolution	No known significant effects or critical hazards.
			PfuUltra HF DNA Polymerase	No known significant effects or critical hazards.
			10X Reaction Buffer	No known significant effects or critical hazards.
		Dpn I	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.	
		pWS4.5 Control Template	No known significant effects or critical hazards.	
		QuikChange XL dNTP Mix	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>Developmental effects</b>	:	QuikSolution	No known significant effects or critical hazards.		
		PfuUltra HF DNA Polymerase	No known significant effects or critical hazards.		
		10X Reaction Buffer	No known significant effects or critical hazards.		
		Dpn I	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.		
		pWS4.5 Control Template	No known significant effects or critical hazards.		
		QuikChange XL dNTP Mix	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.		
		<b>Fertility effects</b>	:	QuikSolution	No known significant effects or critical hazards.
				PfuUltra HF DNA Polymerase	No known significant effects or critical hazards.
				10X Reaction Buffer	No known significant effects or critical hazards.
Dpn I	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.				
pWS4.5 Control Template	No known significant effects or critical hazards.				
QuikChange XL dNTP Mix	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 12: Ecological information

### 12.1 Toxicity

Product/ingredient name	Result	Species	Exposure
<b>QuikSolution</b> Dimethyl sulfoxide	Acute LC50 25000 ppm Fresh water	Daphnia - Daphnia magna - Neonate	48 hours
	Acute LC50 34000000 µg/l Fresh water	Fish - Pimephales promelas	96 hours
	Chronic NOEC 100 µl/L Marine water	Algae - Ulva lactuca	72 hours
<b>PfuUltra HF DNA Polymerase</b> Poly(oxy-1,2-ethanediyl), . alpha.-[(1,1,3,3-tetramethylbutyl)phenyl]-. omega.-hydroxy-	Acute EC50 210 µg/l Fresh water	Algae - Pseudokirchneriella subcapitata	96 hours
	Acute LC50 10800 µg/l Marine water	Crustaceans - Pandalus montagui - Adult	48 hours
	Acute LC50 8600 to 9800 µg/l Fresh water	Daphnia - Daphnia magna - Neonate	48 hours
	Acute LC50 7200 µg/l Fresh water	Fish - Oncorhynchus mykiss	96 hours
<b>10X Reaction Buffer</b> Polyoxyethylene octyl phenyl ether	Acute LC50 5.85 mg/l Fresh water	Crustaceans - Ceriodaphnia rigaudi - Neonate	48 hours

## SECTION 12: Ecological information

<b>Dpn I</b> Sodium chloride	Acute LC50 11.2 mg/l Fresh water	Daphnia - Daphnia magna - Neonate	48 hours
	Acute LC50 4500 µg/l Fresh water	Fish - Pimephales promelas	96 hours
	Acute EC50 2430000 µg/l Fresh water	Algae - Navicula seminulum	96 hours
	Acute EC50 519.6 mg/l Fresh water	Crustaceans - Cypris subglobosa	48 hours
	Acute IC50 6.87 g/L Fresh water	Aquatic plants - Lemna minor	96 hours
<b>XL10-Gold 2-Mercaptoethanol</b> Sodium chloride	Acute LC50 1661 mg/l Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 1000000 µg/l Fresh water	Fish - Morone saxatilis - Larvae	96 hours
	Chronic LC10 781 mg/l Fresh water	Crustaceans - Hyalella azteca - Juvenile (Fledgling, Hatchling, Weanling)	3 weeks
	Chronic NOEC 6 g/L Fresh water	Aquatic plants - Lemna minor	96 hours
	Chronic NOEC 0.314 g/L Fresh water	Daphnia - Daphnia pulex	21 days
	Chronic NOEC 100 mg/l Fresh water	Fish - Gambusia holbrooki - Adult	8 weeks
	Acute EC50 2430000 µg/l Fresh water	Algae - Navicula seminulum	96 hours
	Acute EC50 519.6 mg/l Fresh water	Crustaceans - Cypris subglobosa	48 hours
	Acute IC50 6.87 g/L Fresh water	Aquatic plants - Lemna minor	96 hours
	Acute LC50 1661 mg/l Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 1000000 µg/l Fresh water	Fish - Morone saxatilis - Larvae	96 hours
	Chronic LC10 781 mg/l Fresh water	Crustaceans - Hyalella azteca - Juvenile (Fledgling, Hatchling, Weanling)	3 weeks
	Chronic NOEC 6 g/L Fresh water	Aquatic plants - Lemna minor	96 hours
	Chronic NOEC 0.314 g/L Fresh water	Daphnia - Daphnia pulex	21 days
	Chronic NOEC 100 mg/l Fresh water	Fish - Gambusia holbrooki - Adult	8 weeks

### 12.2 Persistence and degradability

Not available.

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
<b>10X Reaction Buffer</b> Polyoxyethylene octyl phenyl ether	-	-	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>PfuUltra HF DNA Polymerase</b> Poly(oxy-1,2-ethanediyl), . alpha.-[(1,1,3,3-tetramethylbutyl)phenyl]-. omega.-hydroxy-	3.77	78.67	low
<b>10X Reaction Buffer</b> Polyoxyethylene octyl phenyl ether	4.86	-	high
<b>XL10-Gold 2-Mercaptoethanol</b>			

**SECTION 12: Ecological information**

2-Mercaptoethanol	-0.056	-	low
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**12.4 Mobility in soil**

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

**Mobility** : Not available.

**12.5 Results of PBT and vPvB assessment**

**PBT** : Not applicable.

**vPvB** : Not applicable.

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

**SECTION 13: Disposal considerations****13.1 Waste treatment methods**Product

**Methods of disposal** : The generation of waste should be avoided or minimised 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.

**Hazardous waste** : The classification of the product may meet the criteria for a hazardous waste.

Packaging

**Methods of disposal** : The generation of waste should be avoided or minimised wherever possible. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.

**Special precautions** : 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 spilt material and runoff and contact with soil, waterways, drains and sewers.

**SECTION 14: Transport information****Regulatory information**

**ADR/RID / IMDG / IATA** : Not regulated.

**14.6 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.

**14.7 Transport in bulk according to Annex II of Marpol and the IBC Code** : Not available.

**SECTION 15: Regulatory information****15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**EU Regulation (EC) No. 1907/2006 (REACH)Annex XIV - List of substances subject to authorisationAnnex XIV

None of the components are listed.

Substances of very high concern

## SECTION 15: Regulatory information

Ingredient name	Intrinsic property	Status	Reference number	Date of revision
<b>PfuUltra HF DNA Polymerase</b> Poly(oxy-1,2-ethanediyl), .alpha.-[(1,1,3,3-tetramethylbutyl)phenyl]-.omega.-hydroxy-	Substance of equivalent concern for environment	Recommended	ED/169/2012	2/10/2014
<b>10X Reaction Buffer</b> Polyoxyethylene octyl phenyl ether	Substance of equivalent concern for environment	Recommended	ED/169/2012	2/10/2014

<b>Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles</b>	QuikSolution	Not applicable.
	PfuUltra HF DNA Polymerase	Not applicable.
	10X Reaction Buffer	Not applicable.
	Dpn I	Not applicable.
	Control Primer 1 (34-mer)	Not applicable.
	Control Primer 2 (34-mer)	Not applicable.
	pWS4.5 Control Template	Not applicable.
	QuikChange XL dNTP Mix	Not applicable.
	XL10-Gold Ultracompetent cells	Not applicable.
	XL10-Gold	Not applicable.
	2-Mercaptoethanol	Not applicable.
pUC 18 DNA Control Plasmid	Not applicable.	

### Other EU regulations

**Europe inventory** : All components are listed or exempted.

**Industrial emissions (integrated pollution prevention and control) - Air** : Listed

### Ozone depleting substances (1005/2009/EU)

Not listed.

### Prior Informed Consent (PIC) (649/2012/EU)

Not listed.

### Seveso Directive

This product is not controlled under the Seveso Directive.

### International regulations

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

Not listed.

#### Montreal Protocol (Annexes A, B, C, E)

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.

### International lists

#### National inventory

**Australia** : Not determined.

**Canada** : All components are listed or exempted.

## SECTION 15: Regulatory information

<b>China</b>	: Not determined.
<b>Japan</b>	: <b>Japan inventory (ENCS)</b> : Not determined. <b>Japan inventory (ISHL)</b> : Not determined.
<b>Malaysia</b>	: Not determined.
<b>New Zealand</b>	: Not determined.
<b>Philippines</b>	: Not determined.
<b>Republic of Korea</b>	: Not determined.
<b>Taiwan</b>	: All components are listed or exempted.
<b>Turkey</b>	: Not determined.
<b>United States</b>	: All components are listed or exempted.

**15.2 Chemical safety assessment** : This product contains substances for which Chemical Safety Assessments might still be required.

## SECTION 16: Other information

✔ Indicates information that has changed from previously issued version.

**Abbreviations and acronyms** : ATE = Acute Toxicity Estimate  
CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No. 1272/2008]  
DNEL = Derived No Effect Level  
EUH statement = CLP-specific Hazard statement  
PNEC = Predicted No Effect Concentration  
RRN = REACH Registration Number

### Procedure used to derive the classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Classification	Justification
<b>10X Reaction Buffer</b> Eye Irrit. 2, H319	Calculation method
<b>XL10-Gold 2-Mercaptoethanol</b> Eye Dam. 1, H318 Skin Sens. 1, H317 Aquatic Chronic 3, H412	Calculation method Calculation method Calculation method

### Full text of abbreviated H statements

<b>PfuUltra HF DNA Polymerase</b> H315 H318 H411	Causes skin irritation. Causes serious eye damage. Toxic to aquatic life with long lasting effects.
<b>10X Reaction Buffer</b> H302 H315 H318 H319 H335 H411	Harmful if swallowed. Causes skin irritation. Causes serious eye damage. Causes serious eye irritation. May cause respiratory irritation. Toxic to aquatic life with long lasting effects.
<b>Dpn I</b> H319	Causes serious eye irritation.
<b>XL10-Gold 2-Mercaptoethanol</b> H301 H310 H315 H317 H318 H319 H330 H335	Toxic if swallowed. Fatal in contact with skin. Causes skin irritation. May cause an allergic skin reaction. Causes serious eye damage. Causes serious eye irritation. Fatal if inhaled. May cause respiratory irritation.

**SECTION 16: Other information**

H411	Toxic to aquatic life with long lasting effects.
H412	Harmful to aquatic life with long lasting effects.

[Full text of classifications \[CLP/GHS\]](#)

<p><b>PfuUltra HF DNA Polymerase</b>                  Aquatic Chronic 2, H411                  Eye Dam. 1, H318                  Skin Irrit. 2, H315</p> <p><b>10X Reaction Buffer</b>                  Acute Tox. 4, H302                  Aquatic Chronic 2, H411                  Eye Dam. 1, H318                  Eye Irrit. 2, H319                  Skin Irrit. 2, H315                  STOT SE 3, H335</p> <p><b>Dpn I</b>                  Eye Irrit. 2, H319</p> <p><b>XL10-Gold 2-Mercaptoethanol</b>                  Acute Tox. 2, H310                  Acute Tox. 2, H330                  Acute Tox. 3, H301                  Aquatic Chronic 2, H411                  Aquatic Chronic 3, H412                  Eye Dam. 1, H318                  Eye Irrit. 2, H319                  Skin Irrit. 2, H315                  Skin Sens. 1, H317                  STOT SE 3, H335</p>	<p>LONG-TERM AQUATIC HAZARD - Category 2                  SERIOUS EYE DAMAGE/EYE IRRITATION - Category 1                  SKIN CORROSION/IRRITATION - Category 2</p> <p>ACUTE TOXICITY (oral) - Category 4                  LONG-TERM AQUATIC HAZARD - Category 2                  SERIOUS EYE DAMAGE/EYE IRRITATION - Category 1                  SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2                  SKIN CORROSION/IRRITATION - Category 2                  SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE (Respiratory tract irritation) - Category 3</p> <p>SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2</p> <p>ACUTE TOXICITY (dermal) - Category 2                  ACUTE TOXICITY (inhalation) - Category 2                  ACUTE TOXICITY (oral) - Category 3                  LONG-TERM AQUATIC HAZARD - Category 2                  LONG-TERM AQUATIC HAZARD - Category 3                  SERIOUS EYE DAMAGE/EYE IRRITATION - Category 1                  SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2                  SKIN CORROSION/IRRITATION - Category 2                  SKIN SENSITISATION - Category 1                  SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE (Respiratory tract irritation) - Category 3</p>
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**Date of issue/ Date of revision** : 18/10/2016

**Date of previous issue** : No previous validation.

**Version** : 1

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