



American College Of Healthcare Sciences

5940 SW Hood Ave
Portland, OR 97239

Report Number: P183205
Report Date: November 09, 2018
Client Project ID:

Client Sample ID: Clove essential oil Lot 19102R

PAL Sample ID: P183205-01

Sample Type:

Sample Date: 10/29/2018

Received Date: 10/30/2018

Extraction Date: 11/02/2018

Certificate of Analysis

Analysis Date	Analyte	Amount Detected	LOQ (mg/kg)	Notes	Analysis Date	Analyte	Amount Detected	LOQ (mg/kg)	Notes
Modified EPA 8270D (GC-MS/MS)									
11/03/2018	2,6-Dichlorobenzamide	ND	0.50		11/03/2018	a-BHC	ND	0.50	
11/03/2018	Acetochlor	ND	0.50		11/03/2018	Alachlor	ND	0.50	
11/03/2018	Aldrin	ND	0.50		11/03/2018	Ametryn	ND	0.50	
11/03/2018	b-BHC	ND	0.50		11/03/2018	Benfluralin	ND	0.50	
11/03/2018	Bifenthrin	ND	0.50		11/03/2018	Bromopropylate	ND	0.50	
11/03/2018	Buprofezin	ND	0.50		11/03/2018	Captan	ND	10	
11/03/2018	Chlordane	ND	0.50		11/03/2018	Chloroneb	ND	0.50	
11/03/2018	Chlorothalonil	ND	0.50		11/03/2018	Chlorpropham	ND	0.50	
11/03/2018	Chlorpyrifos	ND	0.50		11/03/2018	Chlorpyrifos-methyl	ND	0.50	
11/03/2018	cis-Nonachlor	ND	0.50		11/03/2018	Cyfluthrin	ND	2.5	
11/03/2018	Cypermethrin	ND	2.5		11/03/2018	Dacthal	ND	0.50	
11/03/2018	d-BHC	ND	0.50		11/03/2018	Deltamethrin	ND	2.5	
11/03/2018	Diazinon	ND	0.50		11/03/2018	Dichlobenil	ND	0.50	
11/03/2018	Dichlorofenthion	ND	0.50		11/03/2018	Dichlorvos	ND	0.50	
11/03/2018	Diclofop-methyl	ND	0.50		11/03/2018	Dicloran	ND	2.5	
11/03/2018	Dicofol	ND	0.50		11/03/2018	Dieldrin	ND	0.50	
11/03/2018	Dimethenamid	ND	0.50		11/03/2018	Diphenamid	ND	0.50	
11/03/2018	Diphenylamine	ND	0.50		11/03/2018	Disulfoton	ND	0.50	
11/03/2018	Dithiopyr	ND	0.50		11/03/2018	Endosulfan I	ND	1.0	
11/03/2018	Endosulfan II	ND	1.0		11/03/2018	Endosulfan sulfate	ND	1.0	
11/03/2018	Endrin	ND	0.50		11/03/2018	Endrin aldehyde	ND	0.50	
11/03/2018	Endrin ketone	ND	0.50		11/03/2018	Esfenvalerate	ND	0.50	
11/03/2018	Ethalfuralin	ND	0.50		11/03/2018	Ethofumesate	ND	0.50	
11/03/2018	Ethoprop	ND	0.50		11/03/2018	Ethoxyquin	ND	0.50	
11/03/2018	Etoxazole	ND	0.50		11/03/2018	Etridiazole	ND	0.50	
11/03/2018	Fenarimol	ND	0.50		11/03/2018	Fenoxaprop-ethyl	ND	0.50	
11/03/2018	Fenvalerate	ND	0.50		11/03/2018	Fipronil	ND	0.50	
11/03/2018	Fluazifop-p-butyl	ND	0.50		11/03/2018	Fludioxonil	ND	0.50	
11/03/2018	Fluroxypyr-meptyl	ND	0.50		11/03/2018	Flutolanil	ND	0.50	
11/03/2018	g-BHC	ND	0.50		11/03/2018	Heptachlor	ND	0.50	
11/03/2018	Heptachlor epoxide	ND	0.50		11/03/2018	Hexachlorobenzene	ND	0.50	
11/03/2018	Kresoxim-methyl	ND	0.50		11/03/2018	lambda-Cyhalothrin	ND	1.0	
11/03/2018	Malathion	ND	0.50		11/03/2018	Mefenoxam	ND	0.50	
11/03/2018	Methoxychlor	ND	0.50		11/03/2018	Metolachlor	ND	0.50	
11/03/2018	MGK-264	ND	0.50		11/03/2018	Myclobutanil	ND	0.50	
11/03/2018	Napropamide	ND	0.50		11/03/2018	o-Phenylphenol	ND	0.50	
11/03/2018	Oxadiazon	ND	0.50		11/03/2018	Oxyfluorfen	ND	0.50	
11/03/2018	p,p'-DDD	ND	0.50		11/03/2018	p,p'-DDE	ND	0.50	
11/03/2018	p,p'-DDT	ND	0.50		11/03/2018	Parathion-methyl	ND	0.50	
11/03/2018	PCA	ND	0.50		11/03/2018	PCB	ND	0.50	



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Certificate of Analysis
(Continued)

Analysis Date	Analyte	Amount Detected	LOQ (mg/kg)	Notes	Analysis Date	Analyte	Amount Detected	LOQ (mg/kg)	Notes
Modified EPA 8270D (GC-MS/MS) (Continued)									
11/03/2018	PCNB	ND	0.50		11/03/2018	Pendimethalin	ND	0.50	
11/03/2018	Pentachlorophenyl methyl sulfide	ND	0.50		11/03/2018	Permethrin	ND	2.5	
11/03/2018	Procymidone	ND	0.50		11/03/2018	Prodiamine	ND	0.50	
11/03/2018	Pronamide	ND	0.50		11/03/2018	Propachlor	ND	0.50	
11/03/2018	Pyriproxyfen	ND	0.50		11/03/2018	Quinoxifen	ND	0.50	
11/03/2018	Spirodiclofen	ND	0.50		11/03/2018	Tetraconazole	ND	0.50	
11/03/2018	Tetradifon	ND	0.50		11/03/2018	trans-Nonachlor	ND	0.50	
11/03/2018	Trifluralin	ND	0.50		11/03/2018	Vinclozalin	ND	0.50	
Modified EPA 8321B (HPLC MS-MS)									
11/03/2018	3-Hydroxycarbofuran	ND	0.48		11/05/2018	Abamectin	ND	0.48	
11/03/2018	Acephate	ND	0.48		11/05/2018	Acetamiprid	ND	0.48	
11/05/2018	Acibenzolar-S-methyl	ND	0.96		11/03/2018	Aldicarb	ND	0.48	
11/03/2018	Aldicarb Sulfone	ND	0.48		11/03/2018	Aldicarb Sulfoxide	ND	0.48	
11/03/2018	Allethrin	ND	0.48		11/03/2018	Ametoctradin	ND	0.48	
11/05/2018	Atrazine	ND	0.48		11/03/2018	Azinphos-ethyl	ND	0.48	
11/05/2018	Azinphos-methyl	ND	0.96		11/05/2018	Azoxystrobin	ND	0.48	
11/03/2018	Bendiocarb	ND	0.48		11/03/2018	Bensulide	ND	0.48	
11/05/2018	Bifenazate	ND	0.48		11/03/2018	Bitertanol	ND	0.48	
11/05/2018	Boscalid	ND	0.48		11/03/2018	Bromacil	ND	0.48	
11/05/2018	Carbaryl	ND	0.48		11/05/2018	Carbendazim	ND	0.48	
11/03/2018	Carbofuran	ND	0.48		11/05/2018	Carfentrazone-ethyl	ND	0.48	
11/05/2018	Chlorantraniliprole	ND	0.48		11/03/2018	Clethodim	ND	0.96	
11/05/2018	Clofentezine	ND	0.48		11/05/2018	Clothianidin	ND	0.48	
11/03/2018	Cyanazine	ND	0.48		11/05/2018	Cyantraniliprole	ND	0.48	
11/03/2018	Cyazofamid	ND	0.48		11/03/2018	Cycloate	ND	0.96	
11/05/2018	Cyflufenamid	ND	0.48		11/05/2018	Cyflumetofen	ND	0.48	
11/05/2018	Cymoxanil	ND	0.48		11/05/2018	Cyprodinil	ND	0.48	
11/03/2018	Cyromazine	ND	0.48		11/03/2018	DCPMU	ND	0.48	
11/03/2018	Diazoxon	ND	0.48		11/05/2018	Difenoconazole	ND	0.48	
11/05/2018	Diiflubenzuron	ND	0.48		11/05/2018	Dimethoate	ND	0.48	
11/03/2018	Dimethomorph	ND	0.48		11/03/2018	Dinotefuran	ND	0.48	
11/03/2018	Disulfoton sulfone	ND	0.48		11/05/2018	Diuron	ND	0.48	
11/05/2018	Dodine	ND	0.48		11/03/2018	d-Phenothrin	ND	0.48	
11/05/2018	Emamectin Benzoate	ND	0.48		11/03/2018	Ethion	ND	0.48	
11/05/2018	Famoxadone	ND	0.48		11/03/2018	Famphur	ND	0.48	
11/03/2018	Fenamidone	ND	0.48		11/03/2018	Fenamiphos sulfone	ND	0.48	
11/03/2018	Fenamiphos sulfoxide	ND	0.48		11/03/2018	Fenazaquin	ND	0.48	
11/05/2018	Fenbuconazole	ND	0.48		11/05/2018	Fenbutatin oxide	ND	0.48	



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Certificate of Analysis (Continued)

Analysis Date	Analyte	Amount Detected	LOQ (mg/kg)	Notes	Analysis Date	Analyte	Amount Detected	LOQ (mg/kg)	Notes
Modified EPA 8321B (HPLC MS-MS) (Continued)									
11/05/2018	Fenhexamid	ND	0.48		11/03/2018	Fenobucarb	ND	0.48	
11/05/2018	Fenpropathrin	ND	0.48		11/05/2018	Fenpyroximate	ND	0.48	
11/03/2018	Fenuron	ND	0.48		11/05/2018	Flonicamid	ND	0.48	
11/05/2018	Fluazinam	ND	0.48		11/05/2018	Flubendiamide	ND	0.96	
11/05/2018	Flumioxazin	ND	0.48		11/03/2018	Fluometuron	ND	0.48	
11/03/2018	Fluopicolide	ND	0.48		11/05/2018	Fluopyram	ND	0.48	
11/05/2018	Fluoxastrobin	ND	0.48		11/05/2018	Flupyradifurone	ND	0.48	
11/03/2018	Fluridone	ND	0.48		11/05/2018	Flutriafol	ND	0.48	
11/03/2018	Fluvalinate	ND	0.48		11/05/2018	Fluxapyroxad	ND	0.48	
11/03/2018	Fonofos	ND	0.96		11/05/2018	Formetanate HCl	ND	0.48	
11/03/2018	Hexaconazole	ND	0.48		11/05/2018	Hexazinone	ND	0.48	
11/05/2018	Hexythiazox	ND	0.48		11/05/2018	Imazalil	ND	0.48	
11/05/2018	Imidacloprid	ND	0.48		11/03/2018	Indaziflam	ND	0.48	
11/05/2018	Indoxacarb	ND	0.48		11/05/2018	Iprodione	ND	2.4	
11/03/2018	Isoxaben	ND	0.48		11/03/2018	Linuron	ND	0.48	
11/03/2018	Malaoxon	ND	0.48		11/03/2018	Mandipropamid	ND	0.48	
11/05/2018	Metconazole	ND	0.48		11/03/2018	Methamidophos	ND	0.96	
11/03/2018	Methidathion	ND	0.48		11/03/2018	Methiocarb	ND	0.48	
11/03/2018	Methomyl	ND	0.48		11/05/2018	Methoxyfenozide	ND	0.48	
11/05/2018	Metrafenone	ND	0.48		11/03/2018	Metribuzin	ND	0.48	
11/03/2018	Mevinphos	ND	0.48		11/05/2018	Norflurazon	ND	0.48	
11/05/2018	Novaluron	ND	0.48		11/03/2018	Omethoate	ND	0.48	
11/05/2018	Oryzalin	ND	0.48		11/03/2018	Oxadixyl	ND	0.48	
11/05/2018	Oxamyl	ND	0.48		11/05/2018	Oxydemeton-Methyl	ND	0.48	
11/05/2018	Penthiopyrad	ND	0.48		11/03/2018	Phorate Sulfone	ND	0.48	
11/03/2018	Phorate Sulfoxide	ND	0.48		11/03/2018	Phosalone	ND	0.48	
11/05/2018	Phosmet	ND	0.48		11/03/2018	Phosphamidon	ND	0.48	
11/03/2018	Piperonyl Butoxide	ND	0.48		11/03/2018	Pirimicarb	ND	0.48	
11/03/2018	Pirimiphos-methyl	ND	0.48		11/03/2018	Prometon	ND	0.48	
11/03/2018	Prometryn	ND	0.48		11/05/2018	Propargite	ND	0.48	
11/03/2018	Propazine	ND	0.48		11/05/2018	Propiconazole	ND	0.96	
11/05/2018	Prothioconazole	ND	0.96		11/03/2018	Pymetrozine	ND	0.48	
11/05/2018	Pyraclostrobin	ND	0.48		11/03/2018	Pyraflufen-ethyl	ND	0.48	
11/03/2018	Pyrethrin	ND	2.4		11/05/2018	Pyridaben	ND	0.48	
11/05/2018	Pyrimethanil	ND	0.48		11/05/2018	Rotenone	ND	0.48	
11/05/2018	Saflufenacil	ND	0.48		11/03/2018	Sethoxydim	ND	0.96	
11/03/2018	Siduron	ND	0.48		11/03/2018	Simazine	ND	0.48	
11/03/2018	Simetryn	ND	0.48		11/05/2018	Spinetoram	ND	0.48	
11/05/2018	Spinosad	ND	0.48		11/05/2018	Spiromesifen	ND	0.96	
11/05/2018	Spirotetramat	ND	0.48		11/03/2018	Spiroxamine	ND	0.48	



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Certificate of Analysis
(Continued)

Analysis Date	Analyte	Amount Detected	LOQ (mg/kg)	Notes	Analysis Date	Analyte	Amount Detected	LOQ (mg/kg)	Notes
Modified EPA 8321B (HPLC MS-MS) (Continued)									
11/03/2018	Sulfentrazone	ND	0.48		11/05/2018	Sulfoxaflor	ND	0.48	
11/05/2018	Tebuconazole	ND	0.48		11/05/2018	Tebufenozide	ND	0.48	
11/03/2018	Tebuthiuron	ND	0.48		11/05/2018	Terbacil	ND	0.48	
11/03/2018	Terbutylazine	ND	0.48		11/03/2018	Terbutryn	ND	0.48	
11/05/2018	Thiabendazole	ND	0.48		11/05/2018	Thiacloprid	ND	0.48	
11/05/2018	Thiamethoxam	ND	0.48		11/03/2018	Thiobencarb	ND	0.48	
11/03/2018	Thiodicarb	ND	0.48		11/05/2018	Thiophanate methyl	ND	0.48	
11/05/2018	Tolfenpyrad	ND	0.48		11/05/2018	Triadimefon	ND	0.48	
11/03/2018	Triadimenol	ND	0.96		11/05/2018	Trifloxystrobin	ND	0.48	
11/05/2018	Triflumizole	ND	0.48						

Notes and Definitions

Notes	Definition
LOQ	Limit of Quantitation
ND	Not Detected
*	Not included under current scope of accreditation

The results contained in this report relate only to the items tested.
The results reflect the condition of the samples as received by PAL.
Samples will be stored for a minimum of 60 days after the final report is issued, as described in our Quality Manual.
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PAL is accredited to ISO/IEC 17025:2005 Standard, by PJLA, Accreditation #64422, Testing.