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TG/179/3

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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

UNION INTERNATIONALE POUR LA PROTECTION DES OBTENTIONS VÉGÉTALES

INTERNATIONALER VERBAND ZUM SCHUTZ VON PFLANZEN-ZÜCHTUNGEN

UNIÓN INTERNACIONAL PARA LA PROTECCIÓN DE LAS OBTENCIONES VEGETALES

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

WHITE MUSTARD

(*Sinapis alba* L.)

GENEVA
2001

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These Guidelines should be read in conjunction with document TG/1/2, which contains explanatory notes on the general principles on which the Guidelines have been established.

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I. Subject of these Guidelines

These Test Guidelines apply to all varieties of *Sinapis alba L.*

II. Material Required

1. The competent authorities decide when, where and in what quantity and quality the plant material required for testing the variety is to be delivered. Applicants submitting material from a State other than that in which the testing takes place must make sure that all customs formalities are complied with. The minimum quantity of seed to be supplied by the applicant in one or several samples should be:

500 g

The seed should at least meet the minimum requirements for germination capacity, moisture content and purity for marketing certified seed in the country in which the application is made. The germination capacity should be as high as possible.

2. The plant material must not have undergone any treatment unless the competent authorities allow or request such treatment. If it has been treated, full details of the treatment must be given.

III. Conduct of Tests

1. The minimum duration of tests should normally be two independent growing cycles.

2. The tests should normally be conducted at one place. If any important characteristics of the variety cannot be seen at that place, the variety may be tested at an additional place.

3. The field tests should be carried out under conditions ensuring normal growth. The distance between rows and between plants within the rows should be adjusted to enable observations on individual plants. The size of the plots should be such that plants or parts of plants may be removed for measurement and counting without prejudice to the observations which must be made up to the end of the growing period. Each test should include as a minimum 300 plants which should be divided between three or more replicates. In addition each test should include a replicate of minimum 300 plants for the characteristics assessed by observation of a group of plants.

4. Additional tests for special purposes may be established.

IV. Methods and Observations

1. Unless otherwise stated, all observations for assessment of distinctness and stability should be made on 60 plants or parts taken from each of 60 plants.

2. For the assessment of uniformity

- unless otherwise stated, all observations determined by measurements should be made on 60 plants or parts taken from each of 60 plants (MS)

- all single observations of a group of plants or parts of plants should be made on the total plot of minimum 300 plants.

The variability within the variety should not exceed the variability of comparable varieties already known.

3. Interpretation of results should be made according to the rules for cross-pollinated varieties as stated in the General Introduction to the Test Guidelines.

V. Grouping of Varieties

1. The collection of varieties to be grown should be divided into groups to facilitate the assessment of distinctness. Characteristics which are suitable for grouping purposes are those which are known from experience not to vary, or to vary only slightly, within a variety. Their various states of expression should be fairly evenly distributed throughout the collection.

2. It is recommended that the competent authorities use the following characteristics for grouping varieties:

(a) Seed: erucic acid (characteristic 1)
(b) Ploidy (characteristic 2)
(c) Flower: yellow color of petals (characteristic 13)

VI. Characteristics and Symbols

1. To assess distinctness, uniformity and stability, the characteristics and their states as given in the Table of Characteristics should be used.

2. Notes (numbers), for the purposes of electronic data processing, are given opposite the states of expression for each characteristic. For each characteristic it is indicated whether measurements of a number of single plants or parts of plants (MS), measurement of a group of plants or parts of plants (MG) or visual assessments by a single observation of a group of plants or parts of plants (VG) should be used.

3. Legend:

(*) Characteristics that should be used on all varieties in every growing period over which examinations are made and always be included in the variety descriptions, except when the state of expression of a preceding characteristic or regional environmental conditions render this impossible.

(+) See Explanations on the Table of Characteristics in Chapter VIII.

1) The optimum stage of development for the assessment of each characteristic is indicated by a number in the second column. The stages of development denoted by each number are described at the end of chapter VIII.

MG: measurement of a group of plants or parts of plants
MS: measurement of a number of single plants or parts of plants
VG: visual assessment by a single observation of a group of plants or parts of plants

VII. Table of Characteristics/Tableau des caractères/Merkmalstabelle/Tabla de caracteres

	Stage [1] Stade [1] Stadium [1] Estado [1]	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
1. (*) (+)	**00**	**Seed: erucic acid**	**Semence: acide érucique**	**Samen: Erucasäure**	**Semilla: ácido erúcico**		
		absent	absent	fehlend	ausente	Rizo	1
		present	présent	vorhanden	presente	Emergo	9
2. (*) (+)	**05**	**Ploidy**	**Ploïdie**	**Ploidie**	**Ploidía**		
		diploid	diploïde	diploid	diploide	Emergo	2
		tetraploid	tétraploïde	tetraploid	tetraploide	Oscar	4
3. (+)	**11 MS**	**Cotyledon: length**	**Cotylédon: longueur**	**Keimblatt: Länge**	**Cotiledón: longitud**		
		short to medium	court à moyen	kurz bis mittel	corta a media	Rizo	4
		medium	moyen	mittel	media	Emergo	5
		medium to long	moyen à long	mittel bis lang	media a larga	Silenda	6
4. (+)	**11 MS**	**Cotyledon: width**	**Cotylédon: largeur**	**Keimblatt: Breite**	**Cotiledón: anchura**		
		narrow	étroit	schmal	estrecha		3
		medium	moyen	mittel	media	Emergo	5
		broad	large	breit	ancha	Silvester	7
5. (*)	**16-59 VG**	**Leaf: green color**	**Feuille: couleur verte**	**Blatt: Grünfärbung**	**Hoja: color verde**		
		light	claire	hell	clara		3
		medium	moyenne	mittel	media	Emergo	5
		dark	foncée	dunkel	oscura	Silvester	7

	Stage [1)] Stade [1)] Stadium [1)] Estado [1)]	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
6. **(+)**	**16-59 MS**	**Leaf: number of lobes (fully developed leaf)**	**Feuille: nombre de lobes (feuille complètement développée)**	**Blatt: Anzahl Lappen (vollständig entwickeltes Blatt)**	**Hoja: número de lóbulos (hoja completamente desarrollada)**		
		few	faible	gering	bajo	Maxi	3
		medium	moyen	mittel	medio	Emergo	5
		many	grand	groß	alto	Perine	7
7. **(+)**	**16-59 VG**	**Leaf: dentation of margin**	**Feuille: dentelure du bord**	**Blatt: Zähnung des Randes**	**Hoja: dentado del borde**		
		weak	faible	gering	débil	Gedney	3
		medium	moyenne	mittel	medio	Oscar	5
		strong	forte	stark	fuerte		7
8. **(*)** **(+)**	**16-59 MS**	**Leaf: length (blade and petiole)**	**Feuille: longueur (limbe et pétiole)**	**Blatt: Länge (Spreite und Stiel)**	**Hoja: longitud (limbo y pecíolo)**		
		short	courte	kurz	corta	Rizo	3
		medium	moyenne	mittel	media	Emergo	5
		long	longue	lang	larga	Sirola	7
9. **(*)** **(+)**	**16-59 MS**	**Leaf: width (widest point)**	**Feuille: largeur (au point le plus large)**	**Blatt: Breite (an breitester Stelle)**	**Hoja: anchura (en el punto más ancho)**		
		narrow	étroite	schmal	estrecha	Medico	3
		medium	moyenne	mittel	media	Emergo	5
		broad	large	breit	ancha	Oscar	7
10. **(*)** **(+)**	**16-59 MS**	**Leaf: length of petiole**	**Feuille : longueur du pétiole**	**Blatt: Länge des Stieles**	**Hoja: longitud del pecíolo**		
		short	courte	kurz	corta	Rizo	3
		medium	moyenne	mittel	media	Emergo	5
		long	longue	lang	larga	Sirola	7

	Stage [1)] Stade [1)] Stadium [1)] Estado [1)]	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
11. (*) (+)	**MS**	**Time of flowering**	**Époque de floraison**	**Zeitpunkt der Blüte**	**Época de la floración**		
		very early	très précoce	sehr früh	muy precoz	Carla	1
		early	précoce	früh	precoz	Silenda	3
		medium	moyenne	mittel	medio	Litember	5
		late	tardive	spät	tardía	Sito	7
		very late	très tardive	sehr spät	muy tardía		9
12. (*) (+)	**MG**	**Plant: height at flowering**	**Plante: hauteur au moment de la floraison**	**Pflanze: Höhe zur Zeit der Blüte**	**Planta: altura en floración**		
		low	basse	niedrig	baja	Serval	3
		medium	moyenne	mittel	media	Maxi	5
		tall	haute	hoch	alta	Litember	7
13. (*)	**65 VG**	**Flower: yellow color of petals**	**Fleur: couleur jaune des pétales**	**Blüte: Gelbfärbung der Blütenblätter**	**Flor: color amarillo de los pétalos**		
		light	claire	hell	clara	Figaro	3
		medium	moyenne	mittel	media	Maxi	5
		dark	foncée	dunkel	oscura		7
14.	**65 MS**	**Flower: length of petals**	**Fleur: longueur des pétales**	**Blüte: Länge des Blütenblattes**	**Flor: longitud de los pétalos**		
		short to medium	basse à moyenne	niedrig bis mittel	baja a media	Silenda	4
		medium	moyenne	mittel	media	Caralba	5
		medium to long	moyenne à longue	mittel bis lang	media a larga	Samba	6
15.	**65 MS**	**Flower: width of petals**	**Fleur: largeur des pétales**	**Blüte: Breite des Blütenblattes**	**Flor: anchura de los pétalos**		
		narrow to medium	étroits à moyens	schmal bis mittel	estrecha a media	Martigena	4
		medium	moyens	mittel	media	Ultra	5
		medium to broad	moyens à larges	mittel bis breit	media a ancha	Oscar	6

	Stage [1)] Stade [1)] Stadium [1)] Estado [1)]	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
16. (*)	**89 MS**	**Plant: total length**	**Plante: longueur totale**	**Pflanze: Gesamt-länge**	**Planta: longitud total**		
		short	courte	kurz	corta	Silenda	3
		medium	moyenne	mittel	media	Perine	5
		long	longue	lang	larga	Litember	7
17. (*) (+)	**89 MS**	**Siliqua: length (between peduncle and beak)**	**Silique: longueur (entre le pédoncule et le bec)**	**Schote: Länge (zwischen Stiel und Spitze)**	**Silicua: longitud (entre el pedúnculo y el rostro)**		
		short	courte	kurz	corta	Emergo	3
		medium	moyenne	mittel	media	Litember	5
		long	longue	lang	larga	Fighter	7
18. (*) (+)	**89 MS**	**Siliqua: length of beak**	**Silique: longueur du bec**	**Schote: Länge der Spitze**	**Silicua: Longitud del rostro**		
		short	courte	kurz	corta	Carnaval	3
		medium	moyenne	mittel	media	Torpedo	5
		long	longue	lang	larga	Silvester	7
19. (+)	**89 MS**	**Siliqua: width**	**Silique: largeur**	**Schote: Breite**	**Silicua: anchura**		
		narrow	étroite	schmal	estrecha		3
		medium	moyenne	mittel	media	Maxi	5
		broad	large	breit	ancha	Silvester	7
20. (+)	**89 MS**	**Siliqua: length of peduncle**	**Silique: longueur du pédoncule**	**Schote: Länge des Stieles**	**Silicua: longitud del pedúnculo**		
		short	courte	kurz	corta	Sirola	3
		medium	moyenne	mittel	media	Litember	5
		long	longue	lang	larga	Silvester	7

	Stage [1)] Stade [1)] Stadium [1)] Estado [1)]	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
21.	**89 MS**	**Siliqua: number of seeds**	**Silique: nombre de grains**	**Schote: Anzahl Samen**	**Silicua: número de semillas**		
		low	petit	gering	bajo	Silvester	3
		medium	moyen	mittel	medio	Maxi	5
		high	grand	groß	alto	Litember	7
22. (+)	**89 MS**	**Seed: thousand seed weight**	**Semence: poids de mille grains**	**Samen: Tausend-korngewicht**	**Semilla: peso de mil semillas**		
		low	petit	niedrig	pequeño	Rizo	3
		medium	moyen	mittel	medio	Silenda	5
		high	grand	hoch	grande	Oscar	7
23. (+)	**VG**	**Generative development in year of sowing for late summer sown trials**	**Formation d'inflorescences, l'année du semis dans un essai semé tard en été**	**Generative Entwicklung im Aussaatjahr bei Spätsommer aussaat**	**Desarrollo generativo el año de siembra en los ensayos sembrados al final del verano**		
		absent or very weak	absent ou très faible	fehlend oder sehr gering	ausente o muy débil		1
		weak	faible	gering	débil	Sina	3
		medium	moyen	mittel	media	Silvester	5
		strong	grand	stark	fuerte	Maxi	7
		very strong	très grand	sehr stark	muy fuerte	Rizo	9

VIII. Explanations on the Table of Characteristics

Ad. 1: Seed: erucic acid

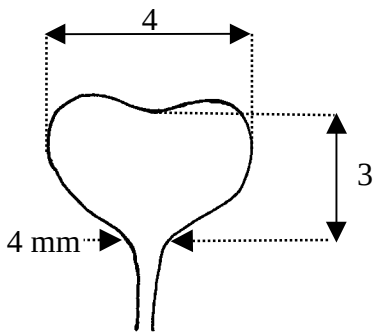
The erucic acid content should be observed on seed sent in by the applicant. It should be expressed as a percentage by mass of methyl esters in accordance with the ISO standard in document 5508, paragraph 6.2.2.1. Seed containing 2% or less of erucic acid will be classified as "absent."

Ad. 2: Ploidy

Ploidy should be assessed on at least 100 seedlings.

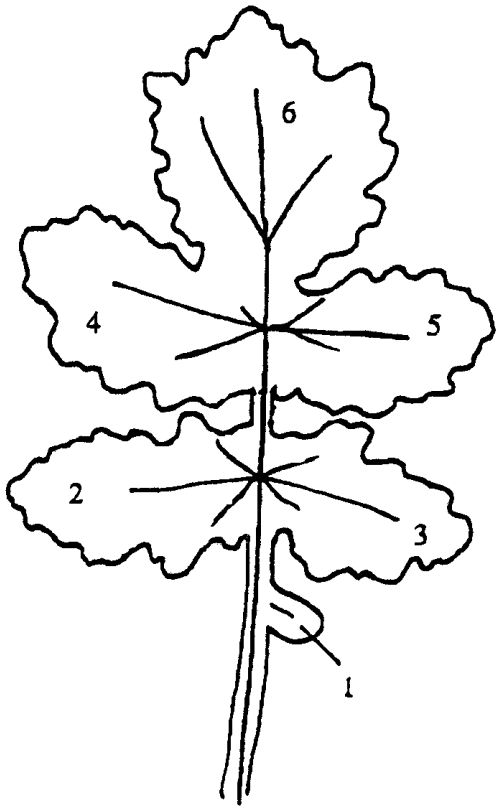
Ad. 3 + 4: Cotyledon: length (3) and width (4)

The measurement should be taken in the glasshouse. If the two cotyledons differ in size, the bigger one should be measured. The length is defined as distance between the inclination at top of the cotyledon and the point where the width of the petiole is about 4 mm. The width of the cotyledon should be measured at the widest point of the cotyledons.



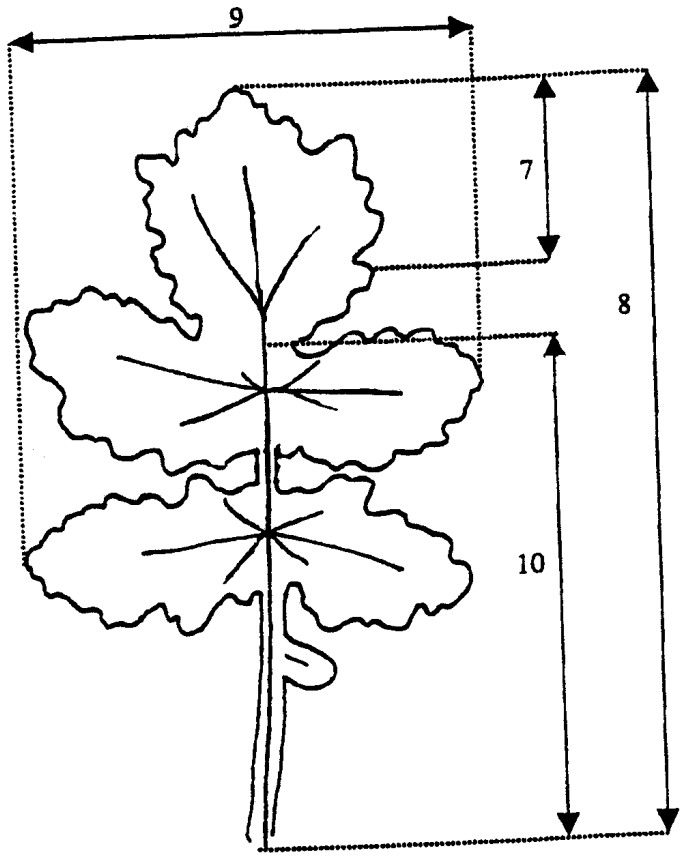
Ad. 6: Leaf: number of lobes

Parts of the leaf blade are considered as lobes if their length is at least equivalent to the width of the leaf petiole at their point of attachment and if the upper notch of the blade has at least half the length of the lobe itself.



Ad. 7-10: Leaf: dentation (7), length (8), width (9), length of petiole (10)

7 = part on which the dentation should be recorded (characteristic 7)



Ad. 11: Time of flowering

The observation should be done at least three times per week and more frequently if there is any need to do so. The date should be calculated - if necessary by interpolation - at which 50% of plants show at least one open flower.

When assessed on the plot as a whole, the recommended percentage is 10%. This characteristic may be useful for arranging the varieties in the collection.

Ad. 12 : Plant: height at flowering

The height of the plants should be assessed when all normally developed plants have opened at least one flower.

Ad. 17-21: Siliqua

All observations on the siliqua should be recorded in the midpart of the inflorescence of the main stem.

Ad. 22: Seed: thousand seed weight

Per replicate a bulk sample of 20 siliques should be taken.

Ad. 23: Generative development in year of sowing for late summer sown trials

The observation of the growth stages reached (proportion of plants below bud stage, in bud stage, in flowering stage, in stage of siliqua formation) should be made in autumn, when the development stagnates.

Alternatively the beginning of flowering may be observed in this trial; early flowering would mean strong generative development, late flowering would mean weak development.

Phenological growth stages according to the BBCH-identification keys of oilseed rape (Meier, 1997)

Code	Description
Principal growth stage 0: Germination	
00	Dry seed
01	Beginning of seed imbibition
03	Seed imbibition complete
05	Radicle emerged from seed
07	Hypocotyl with cotyledons emerged from seed
08	Hypocotyl with cotyledons growing towards soil surface
09	Emergence: cotyledons emergence through soil surface
Principal growth stage 1: Leaf development	
10	Cotyledons completely unfolded
11	First leaf unfolded
12	2 leaves unfolded
13	3 leaves unfolded
14	4 leaves unfolded
15	5 leaves unfolded
16	6 leaves unfolded
17	7 leaves unfolded
18	8 leaves unfolded
19	9 or more leaves unfolded
Principal growth stage 2: Formation of side shoots	
20	No side shoots
21	Beginning of side shoot development: first side shoot visible
22	2 side shoots visible
23	3 side shoots visible
24	4 side shoots visible
25	5 side shoots visible
26	6 side shoots visible
27	7 side shoots visible
28	8 side shoots visible
29	End of side shoot development: 9 or more side shoots visible
Principal growth stage 3: Stem elongation	
30	Beginning of stem elongation: no internodes (‘rosette’)
31	1 visibly extended internodes
32	2 visibly extended internodes
33	3 visibly extended internodes
34	4 visibly extended internodes
35	5 visibly extended internodes
36	6 visibly extended internodes
37	7 visibly extended internodes
38	8 visibly extended internodes
39	9 or more visibly extended internodes
Principal growth stage 4: --	

Code	Description
Principal growth stage 5: Inflorescence emergence	
50	Flower buds present, still enclosed by leaves
51	Flower buds visible from above (“green bud”)
52	Flower buds free, level with the youngest leaves
53	Flower buds raised above the youngest leaves
55	Individual flower buds (main inflorescence) visible but still closed
57	Individual flower buds (secondary inflorescences) visible but still closed
59	First petals visible, flower buds still closed (“yellow bud”)
Principal growth stage 6: Flowering	
60	First flowers open
61	10 % of flowers on main raceme open, main raceme elongating
62	20 % of flowers on main raceme open
63	30 % of flowers on main raceme open
64	40 % of flowers on main raceme open
65	Full flowering: 50 % flowers on main raceme open, older petals falling
67	Flowering declining: majority of petals fallen
69	End of flowering
Principal growth stage 7: Development of fruit	
71	10 % of pods have reached final size
72	20 % of pods have reached final size
73	30 % of pods have reached final size
74	40 % of pods have reached final size
75	50 % of pods have reached final size
76	60 % of pods have reached final size
77	70 % of pods have reached final size
78	80 % of pods have reached final size
79	Nearly all pods have reached final size
Principal growth stage 8: Ripening	
80	Beginning of ripening: seed green, filling pod cavity
81	10 % of pods ripe, seeds dark and hard
82	20 % of pods ripe, seeds dark and hard
83	30 % of pods ripe, seeds dark and hard
84	40 % of pods ripe, seeds dark and hard
85	50 % of pods ripe, seeds dark and hard
86	60 % of pods ripe, seeds dark and hard
87	70 % of pods ripe, seeds dark and hard
88	80 % of pods ripe, seeds dark and hard
89	Fully ripe: nearly all pods ripe, seeds dark and hard

IX. Literature

Growth stages of mono- and dicotyledonous plants: BBCH-Monograph. Federal Biological Research Centre of Agriculture and Forestry (ed.) Ed. by Uwe Meier.-Berlin; Wien [u.a.]: Blackwell Wiss.-Verl., 1997.

X. Technical Questionnaire

	Reference Number (not to be filled in by the applicant)

TECHNICAL QUESTIONNAIRE
to be completed in connection with an application for plant breeders' rights

1. Species	*Sinapis alba L.* WHITE MUSTARD
2. Applicant (Name and address)	
3. Proposed denomination or breeder's reference	

4. Information on origin, maintenance and reproduction of the variety

4.1 Genetic origin and breeding method

4.2 Other information

5. Characteristics of the variety to be indicated (the number in brackets refers to the corresponding characteristic in Test Guidelines; please mark the state of expression which best corresponds).

	Characteristics	Example Varieties	Note
5.1 (1)	**Seed: erucic acid**		
	absent	Rizo	1 [ ]
	present	Emergo	9 [ ]
5.2 (2)	**Ploidy**		
	diploid	Emergo	2 [ ]
	tetraploid	Oscar	4 [ ]
5.3 (11)	**Time of flowering**		
	very early	Carla	1 [ ]
	early	Silenda	3 [ ]
	medium	Litember	5 [ ]
	late	Sito	7 [ ]
	very late		9 [ ]

	Characteristics	Example Varieties	Note
5.4 (16)	**Plant: total length**		
	short	Silenda	3 [ ]
	medium	Perine	5 [ ]
	long	Litember	7 [ ]

6. Similar varieties and differences from these varieties

Denomination of similar variety	Characteristic in which the similar variety is different o)	State of expression of similar variety	State of expression of candidate variety

o) In the case of identical states of expressions of both varieties, please indicate the size of the difference.

7. Additional information which may help to distinguish the variety

7.1 Resistance to pest and diseases

7.2 Special conditions for the examination of the variety

7.3 Other information

8. Authorization for release

(a) Does the variety require prior authorization for release under legislation concerning the protection of the environment, human and animal health?

Yes [ ] No [ ]

(b) Has such authorization been obtained?

Yes [ ] No [ ]

If the answer to that question is yes, please attach a copy of such an authorization.

[End of document]