Land Information New Zealand
Toitū te whenua

Rules for Assessment of Carrying Capacity of Crown Pastoral Land (Rents for Pastoral Leases)

LINZS30302

21 December 2012

Presented to the House of Representatives under Section 4 of the Regulations (Disallowance) Act 1989

Foreword

Introduction

The Rules for Assessment of Carrying Capacity of Crown Pastoral Land (Rents for Pastoral Leases) (Rules) are issued by the Valuer-General under s 23O of the Crown Pastoral Land Act 1998 (Act) to ensure an efficient, predictable, and objective process for setting pastoral lease rents, based on earning capacity, which can be monitored and audited.

Purpose of the Rules

The purpose of the Rules is to provide clear requirements for assessors when undertaking assessments to calculate the base and current carrying capacity of land held under a pastoral lease, and to provide clear requirements for expert determiners when undertaking determinations.

Superseded documents

These are new Rules and do not supersede any previous rules or standards.

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PART A: INTRODUCTION

Title and commencement

(a) The Rules may be cited as the Rules for Assessment of Carrying Capacity of Crown Pastoral Land (Rents for Pastoral Leases).

(b) The Rules come into effect on 21 December 2012.

Scope

The Rules specify the information:

(a) the Commissioner of Crown Lands (Commissioner) must provide or reference under s 23C(4), and

(b) that may or may not be used, and the processes that must be used in relation to assessments.

Application

The Rules apply:

(a) to the Commissioner in his or her role under s 23C,

(b) to assessors making an initial assessment under s 23D(1),

(c) (with any necessary modifications) to lessees' assessors making assessments under s 23G(1)(d),

(d) (with any necessary modifications) to any assessors undertaking a revision of the assessments under s 23D(1) or as part of the steps set out in ss 23D to 23H(1)(a),

(e) (with any necessary modifications) to an expert determiner making a determination under s 23H(1)(b), and

(f) to lessees when accepting or rejecting the Crown assessor's initial assessment under s 23D(4).

Terms and definitions

For the purposes of the Rules, the following terms and definitions apply. Any reference to a section in these Rules is a reference to that section of the Crown Pastoral Land Act 1998.

Term / abbreviation	Definition
Act	Crown Pastoral Land Act 1998
assessor	a Crown assessor, lessee assessor and, when making a determination under s 23H(1)(b) of the Crown Pastoral Land Act 1998, an expert determiner
authoritative data sets	the datasets that are listed in Appendix 1, Appendix 2 and Appendix 3
base carrying capacity	as defined in s 2 Crown Pastoral Land Act 1998
Commissioner	as defined in s 2 of the Crown Pastoral Land Act 1998
current carrying capacity	as defined in s 2 Crown Pastoral Land Act 1998
expert determiner	as defined in s 2 of the Crown Pastoral Land Act 1998
lessee's assessor	as defined in s 2 of the Crown Pastoral Land Act 1998
LUC	land use capability as explained in Appendix 5
Model 1	the model described in Appendix 1: Model 1 and Set 1
Model 2	the model described in Appendix 1: Model 1 and Set 1
pastoral lease	as defined in s 4 of the Crown Pastoral Land Act 1998
Rules	Rules for Assessment of Carrying Capacity of Crown Pastoral Land (Rents for Pastoral Leases)
Set 1	the pastoral leases listed in Table 11, Appendix 1
Set 2	the pastoral leases listed in Table 12, Appendix 2
Set 3	the pastoral leases listed in Table 13, Appendix 3
stock unit (SU)	as defined in Appendix 4

Part B: Assessing carrying capacities

1 Assessment of base carrying capacity for leases in Set 1

1.1 Information from the Commissioner

1.1.1 Commissioner requirements

The Commissioner must provide or refer assessors to:

(a) available information describing or showing the boundaries of the pastoral lease, and

(b) the information prescribed in rule 1.1.2 (in rule 1 called the Model 1 outputs).

1.1.2 Model 1 outputs

(a) The Model 1 outputs must:

(i) be produced by applying Model 1 (Appendix 1: Model 1 and Set 1);

(ii) cover an area (in rule 1 called the modelled area) which substantially corresponds to the area of the pastoral lease;

(iii) be published by the Valuer-General;

(iv) include a table (for example, refer to Table 1 below) that shows the:

(A) land use capability (LUC) units that the relevant authoritative dataset indicates are present in the modelled area,

(B) areas (in ha) of the LUC units referred to in (A),

(C) sum (in ha) of the areas of the LUC units referred to in (A),

(D) BASE (in stock units) produced by Model 1 for each of the LUC units referred to in (A),

(E) mean BASE/ha (in stock units/ha) produced by Model 1 for the LUC units referred to in (A), and

(F) total modelled base in stock units produced by Model 1 for the whole of the modelled area (called modelled base).

COMMENTARY

In rule 1.1.2, the term BASE relates to the outputs for the model as described in Appendix 1 in the BASE output table.

Table 1:

LUC unit	Mean BASE (SU / ha) for LUC unit	Total Area (in ha)	BASE(in stock units) of LUC unit
2s1	2.17	17.30	37
4s1	0.77	178.00	130
6e29	0.26	2214.50	558
7e12	0.17	0.42	0
7e23	0.11	785.40	103
		Modelled base	828

COMMENTARY

- The figures in the fourth column are not necessarily the multiplication of the figures in the second and third columns because of the application of Model 1 across the entire pastoral lease.
- If there is only one polygon of LUC unit on a pastoral lease, then the pure multiplication of column two by column three will equal the BASE (SU) in column four, as is the case for LUC unit 2s1 above.
- It is more likely, however, that there will be a number of different polygons of the individual LUC unit across a pastoral lease.
- Each polygon will have a different BASE SU/ha due to the varying physical characteristics of the elements in the model; for example, altitude, aspect, VPD, etc.
- The mean BASE SU/ha is the average across all polygons of the LUC unit.
- Consequently, the total area (in ha) and total BASE (in stock units) are the sum of all the polygons of that LUC unit as derived by the model.
- Taking the above example for LUC unit 4s1, the result of the modelling is:

	LUC	Mean elevation (metres)	Mean aspect (degrees)	Mean annual soil temperature	Mean vdp (Jan)	hectares (ha)	Mean BASE SU / ha	Total BASE (SU)
Polygon 1	4s 1	240	21	12.02	63	1.28	0.79	1
Polygon 2	4s 1	291	22	11.39	61	1.76	0.83	1
Polygon 3	4s 1	241	20	11.80	62	77.99	0.74	58
Polygon 4	4s 1	220	10	11.64	60	97.00	0.72	70
						178.00	**0.77**	**130**

Therefore, the figures for LUC 4s1 that are shown in the summary table (Table 1 above) are:

Hectares (ha)	178.00
Mean BASE/ha	0.77
Total BASE	130.00

For more detailed information on the application of the model and the use of area weighted averages in the modelling, see Appendix 1 and Appendix 2 and guidance material issued with the Rules.

(v) include a map or maps (capable of rendering at A3) which display, as far as practicable, all the information in (iv) overlaid on a recent topographic map or recent high resolution imagery of the modelled area; and

(vi) include a map or maps (capable of rendering at A3), depicting the modelled area boundaries and, from available information, the apparent boundary of the pastoral lease.

(b) The modelled area and modelled base (refer (a)(iv)(F)) must be those in the columns so headed in Table 11, Appendix 1, unless revised figures have been published by the Valuer-General.

COMMENTARY

- The values for modelled base in Table 11, Appendix 1 are the outputs of Model 1 applied to an area which substantially corresponds with the boundaries of the pastoral lease.
- The modelled base in Table 11, Appendix 1 can be used in assessments.
- It is possible that Model 1 could be run again in the future, up until the time the assessment is made, on a new area which corresponds even more closely to the boundaries of the pastoral lease.
- If Model 1 is run again in the future, as described in rule 1.1.2(b), a different modelled base would be produced and, if published by the Valuer-General, would be used in assessments.

1.2 Information that must be used in the process to assess base carrying capacity

At any stage of the process, the following must be used for assessing base carrying capacity, including the calculation required by rule 1.4.7:

(a) information to which the Commissioner has referred the assessor under rule 1.1.1, and

(b) information that is relevant to the process for assessing base carrying capacity and which is revealed in steps under s 23C to 23H(1)(a), up to the time the assessment is made.

COMMENTARY

- It is intended that information from the lessee (or representative) under s 23D(2) would form part of the consideration of the Crown's assessor.
- The steps in ss 23E to 23H(1)(a) involve the possibility of reconsideration and revisiting the elements of the specified process or the result. For example, relevant information may come from the other assessors' processes or information, new information about the land, or advice from the expert determiner.

1.3 Information that must not be used in the process to assess base carrying capacity

1.3.1 Information not to be used

The following information about the land must not be used to assess base carrying capacity:

(a) differences between the facts and Model 1, including:

(i) any difference between any articulation of unimproved carrying capacity and modelled base,

(ii) any difference between any characteristic of the land and values for that characteristic in the authoritative datasets used in Model 1, and

(iii) that any area could be assigned to a different LUC unit or units than that to which it is assigned in the relevant authoritative dataset used in Model 1;

(b) facts about the land or its use at any time, including:

(i) the physical characteristics of the land other than those for which values exist in the authoritative datasets used in Model 1,

(ii) the state of the land at any time including, but not limited to, vegetative cover and soils,

(iii) the capacity of the land to carry stock,

(iv) the stock carried on the land at any time, and

(v) constraints which would affect stock carrying capacity in an unimproved state, including physical and legal constraints;

(c) inferences or assertions about the land or its use at any time, including:

(i) inferences made about any of the matters in (b),

(ii) any other inferences related to unimproved carrying capacity, and

(iii) valuations of the land or any element of it;

(d) notions about, or articulations of, unimproved state, including:

(i) notions about unimproved state, (which includes any concept, however described, that requires consideration of land as though it had not been developed as it has been developed),

(ii) as part of valuations or assessments of land value or unimproved value under rating legislation,

(iii) as part of valuations of rental value or the value of land exclusive of improvements under the Crown Pastoral Land Act 1998 or the Land Act 1948,

(iv) as part of case law or valuation practice, and

(v) those used in any documents related to the administration of the pastoral lease under the Crown Pastoral Land Act 1998 or the Land Act 1948.

1.3.2 Exception

Rule 1.3.1 does not apply to the extent that consideration of information is explicitly and necessarily required in the specified process; for example, by rule 1.4.5(b)(ii), which requires consideration of whether land is physically accessible.

1.4 The specified process for assessing base carrying capacity

1.4.1 Specified process

(a) The process set out in rule 1.4 is the only process or method that may be used to assess base carrying capacity for leases in Set 1.

(b) Assessors must use, when making estimates or calculations:

(i) the simplest method that is appropriate to the purpose of the rule that requires the estimate or calculation. For examples, refer to Table 2 in rule 1.4.4 and Table 3 in rule 1.4.6, and

(ii) annual equivalent stock unit numbers for stock carried on the land for any period in proportion to the part of the year that the stock spends on the land (whether or not that stock is also grazed on any other ground that is not subject to the pastoral lease). For example, refer to Appendix 4.

1.4.2 Steps in the process

Assessors must:

(a) establish, with sufficient accuracy, the boundaries of the pastoral lease,

(b) determine if there is a boundary variation between the modelled area and the area of the pastoral lease established under (a),

(c) estimate whether it is reasonably possible that the area discrepancy threshold (as defined in rule 1.4.3) is exceeded and, if so, make the determination in rule 1.4.4(b),

(d) estimate whether it is reasonably possible that the isolation/access threshold in rule 1.4.5(a) is exceeded and, if so, make the determination in rule 1.4.6(b), and

(e) use Table 4 in rule 1.4.7 to calculate the base carrying capacity of the pastoral lease.

1.4.3 Area discrepancy threshold

The area discrepancy threshold is exceeded if the modelled area differs from the area of the pastoral lease, to the extent that if Model 1 were applied to the area of the pastoral lease, it would produce a base carrying capacity which differs by 10 % or more from modelled base.

> **COMMENTARY**
>
> The area of the pastoral lease may differ from the area shown on the title.

1.4.4 Process for estimating or determining area discrepancy

(a) Assessors must estimate if it is reasonably possible that the area discrepancy threshold is exceeded and, if so, determine whether the area discrepancy threshold is actually exceeded.

(b) With the exception of the leases listed in (c), if the area discrepancy threshold is actually exceeded, assessors must:

(i) (unless rule 1.4.1(b) requires a different method) use the table and map or maps in rule 1.1.2(a)(iv) and (v) showing BASE (in stock units) shown on LUC units, and

(ii) determine the BASE (in stock units) that Model 1 would produce if it were applied to the area of the pastoral lease.

COMMENTARY

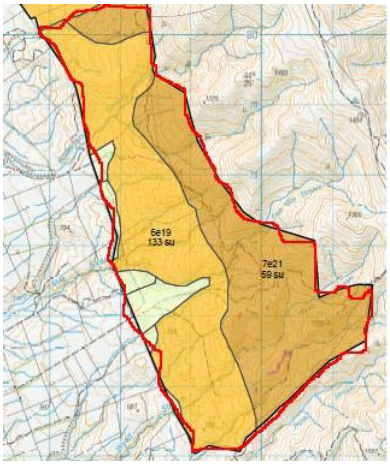
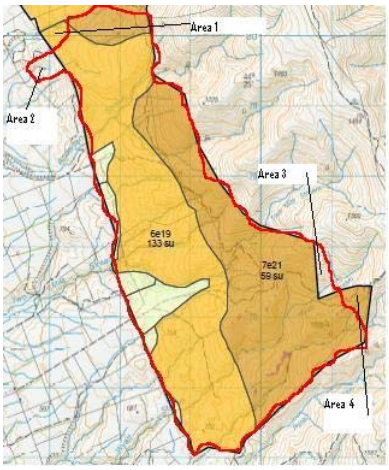
- Assessors may need to approximate the pastoral lease area using revised boundaries, for example refer Table 2.
- An example of a different method would be an assessor considering another assessor's workings during dispute resolution and, if they agree, then adopting those workings.

(c) For the following leases, the mapped area must be used in the assessment of base carrying capacity, regardless of the area of the pastoral lease:

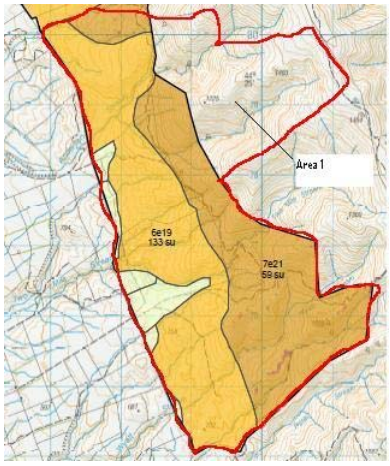
- Lilybank
- Glentanner Pt139 and Pt106
- Huxley Gorge Pt139
- Breast Hill
- The Branches
- Earnslaw.

Table 2

Legend	
	Modelled Area Boundary
	Pastoral Lease Boundary

	**Example One:** **Where area differences do not exceed threshold** The pastoral lease boundary and modelled area boundary are very similar. Therefore it is **not** reasonably possible that the 10 % threshold is exceeded.
	**Example Two:** **Where area differences do not exceed threshold** • Area 1 is outside lease boundary but included in modelled base. • Area 2 is inside lease boundary but not included in modelled base. • Area 3 is inside lease boundary but not included in modelled base. • Area 4 is outside lease boundary but included in modelled base. • Areas 1 and 2 are similar in area, LUC unit and BASE/ha. • Areas 3 and 4 are similar in area, LUC unit and BASE/ha. Therefore it is **not** reasonably possible that the 10 % threshold is exceeded.

Legend	
———	Modelled Area Boundary
———	Pastoral Lease Boundary



Example Three:

Where area differences exceed threshold and determination is required

Area 1 is inside lease boundary but not included in modelled base.

Therefore a large area exceeding threshold is reasonably possible.

Steps:

1. Estimate land area in Area 1.
2. Ascertain LUC unit (assume unit 7 in this case).
3. Adopt BASE SU/ha rate for similar LUC unit (from Table 1).
4. Multiply step 1 by step 3 to arrive at an estimate of BASE for Area 1.
5. Determine if this causes the area discrepancy threshold of 10 % to be exceeded.

1.4.5 Isolation / access threshold

(a) The isolation/access threshold is exceeded if the summation of the individual BASE (in stock units) produced on LUC units by Model 1 for all relevant areas is 10 % or more of modelled base.

(b) An area is a relevant area for the purposes of this rule if it:

(i) is assigned an LUC unit of 1, 2, 3, 4, 5, or 6 in the relevant authoritative dataset, and

(ii) is so isolated that it is not physically accessible for stock, either through the pastoral lease, or other land.

1.4.6 Process for estimating or determining isolation / access

Assessors must estimate if it is reasonably possible that the isolation/access threshold is exceeded and, if so, determine whether the isolation/access threshold is in fact exceeded and, if so:

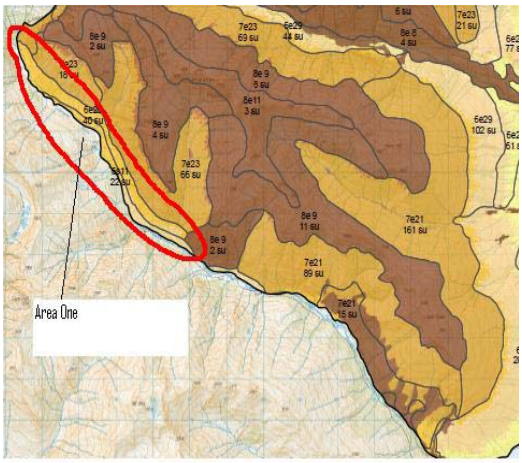
(a) (unless rule 1.4.1(b) requires a different method) use the table and map or maps in rule 1.1.2(a)(iv) and (v), and

(b) determine the BASE (in stock units) produced by the model for all relevant areas.

COMMENTARY:

An example of a different method would be an assessor considering another assessor's workings and, if they agree, then adopting those workings.

Table 3

	**Example One:** **Where the isolation / access differences do not exceed threshold** Steps: 1. Identify areas of modelled base that satisfy criteria set out in rule 1.4.5(b)(i) and 1.4.5(b)(ii). 2. Area One meets criteria by being LUC unit 6 and meeting isolation/access criteria. 3. Identify BASE for this area (40 SU and 22 SU in this case). (In this case, modelled base is 2200.) 4. Determine if this causes the isolation/access threshold to be exceeded. 5. 62 SU is less than 10 % of 2200 SU therefore threshold is **not** exceeded.

1.4.7 Calculating base carrying capacity

Assessors must calculate base carrying capacity according to Table 4 below.

Table 4

Case	Is the area discrepancy threshold exceeded?	Is the isolation / access threshold exceeded?	How base carrying capacity must be assessed
1	no[1]	no[2]	Base carrying capacity is modelled base.
2	yes	no[2]	Base carrying capacity is the result of the determination required by rule 1.4.4.
3	no[1]	yes	Base carrying capacity is modelled base less the result of the determination required by rule 1.4.6.
4	yes	yes	Base carrying capacity is the result of the determination required by rule 1.4.4, less the result of the determination required by rule 1.4.6.

[1] Either because, under rule 1.4.4(a), it has been estimated that it is not reasonably possible that the area discrepancy threshold is exceeded, or it has actually been determined that the area discrepancy threshold has not been exceeded.

[2] Either because, under rule 1.4.6(a), it has been estimated that it is not reasonably possible that the isolation/access threshold is exceeded, or it has actually been determined that the isolation/access threshold is not exceeded.

2 Assessment of base carrying capacity for leases in Set 2.

2.1 Information from the Commissioner

2.1.1 Commissioner requirements

The Commissioner must provide or refer assessors to:

(a) available information describing or showing the boundaries of the pastoral lease, and

(b) the information prescribed in rule 2.1.2 (in rule 2 called the Model 2 outputs).

2.1.2 Model 2 outputs

(a) The Model 2 outputs must:

(i) be produced by applying Model 2 (Appendix 2: Model 2 and Set 2);

(ii) cover an area (in rule 2 called the modelled area) which substantially corresponds to the area of the pastoral lease;

(iii) be published by the Valuer-General;

(iv) include a table (for example, refer to Table 5 below) that shows the:

(A) LUC units that the relevant authoritative dataset indicates are present in the modelled area,

(B) areas (in ha) of the LUC units referred to in (A),

(C) sum (in ha) of the areas of the LUC units referred to in (A),

(D) BASE (in stock units) produced by Model 2 for each of the LUC units referred to in (A),

(E) mean BASE/ha (in stock units/ha) produced by Model 2 for the LUC units referred to in (A), and

(F) total modelled base in stock units produced by Model 2 for the whole of the modelled area (called modelled base);

COMMENTARY

In rule 2.1.2, the term BASE relates to the outputs for the model as described in Appendix 2 in the BASE output table.

Table 5

LUC unit	Mean BASE (SU / ha) for LUC unit	Total Area (in ha)	BASE (in stock units) of LUC unit
2s1	2.17	17.30	37
4s1	0.77	178.00	130
6e29	0.26	2214.50	558
7e12	0.17	0.42	0
7e23	0.11	785.40	103
		Modelled base	828

COMMENTARY

- The figures in the fourth column are not necessarily the multiplication of the figures in the second and third columns because of the application of Model 2 across the entire pastoral lease.
- If there is only one polygon of LUC unit on a pastoral lease then the pure multiplication of column two by column three will equal the BASE (SU) in column four, as is the case for LUC unit 2s1 above.
- It is more likely however, that there will be a number of different polygons of the individual LUC unit across a pastoral lease.
- Each polygon will have a different BASE SU/ha due to the varying physical characteristics of the elements in the model, for example, altitude, aspect, VPD, etc.
- The mean BASE SU/ha is the average across all polygons of the LUC unit.
- Consequently the total area (in ha) and total BASE (in stock units) are the sum of all the polygons of that LUC unit as derived by the model.
- Taking the above example, for LUC unit 4s1, the result of the modelling is:

	LUC	Mean elevation (metres)	Mean aspect (degrees)	Mean annual soil temperature	Mean vdp (Jan)	hectares (ha)	Mean BASE SU / ha	Total BASE (SU)
Polygon 1	4s 1	240	21	12.02	63	1.28	0.79	1
Polygon 2	4s 1	291	22	11.39	61	1.76	0.83	1
Polygon 3	4s 1	241	20	11.80	62	77.99	0.74	58
Polygon 4	4s 1	220	10	11.64	60	97.00	0.72	70
						178.00	**0.77**	**130**

Therefore, the figures for LUC 4s1, that are shown in the summary table (Table 5 above), are:

Hectares (ha)	178.00
Mean BASE/ha	0.77
Total BASE	130.00

For more detailed information on the application of the model and the use of area weighted averages in the modelling, see Appendix 1 and Appendix 2, and guidance material issued with these Rules.

(v) include a map or maps (capable of rendering at A3) which display, as far as practicable, all the information in rule (iv) overlaid on a recent topographic map or recent high resolution imagery of the modelled area; and

(vi) include a map or maps (capable of rendering at A3), depicting the modelled area boundaries and, from available information, the apparent boundary of the pastoral lease.

(b) The modelled area and modelled base (refer rule 2.1.2(iv)(F)) must be those in the columns so headed in Table 12, Appendix 2 unless revised figures have been published by the Valuer-General.

COMMENTARY

- The values for modelled base in Table 12, Appendix 2 are the outputs of Model 2 applied to an area which substantially corresponds with the boundaries of the pastoral lease.
- The modelled base in Table 12, Appendix 2 can be used in assessments.
- It is possible that Model 2 could be run again in the future, up until the time the assessment is made, on a new area which corresponds even more closely to the boundaries of the pastoral lease.
- If Model 2 is run again in the future, as described in rule 2.1.2(b), a different modelled base would be produced and, if published by the Valuer-General, would be used in assessments.

2.2 Information that must be used in the process to assess base carrying capacity

The following information must be used at any stage of the process for assessing base carrying capacity, including the calculation required by rule 2.4.7:

(a) information to which the Commissioner has referred the assessor under rule 2.1.1, and

(b) information that is relevant to the process for assessing base carrying capacity and which is revealed in steps under s 23C to 23H(1)(a), up to the time the assessment is made.

COMMENTARY

- It is intended that information from the lessee (or representative) under s 23D(2) would form part of the consideration of the Crown's assessor.
- The steps in ss 23E to 23H(1)(a) involve the possibility of reconsideration and revisiting the elements of the specified process or the result. For example, relevant information may come from the other assessors' processes or information, relevant new information about the land, or advice from the expert determiner.

2.3 Information that must not be used in the process to assess base carrying capacity

2.3.1 Information not to be used

The following information about the land must not be used to assess base carrying capacity:

(a) differences between the facts and Model 2, including:

(i) any difference between any articulation of unimproved carrying capacity and modelled base,

(ii) any difference between any characteristic of the land and the values for that characteristic in the authoritative datasets used in Model 2, and

(iii) that any area could be assigned to a different LUC unit or units than that to which it is assigned in the relevant authoritative dataset used in Model 2;

(b) facts about the land or its use at any time, including:

(i) the physical characteristics of the land other than those for which values exist in the authoritative datasets used in Model 2,

(ii) the state of the land at any time including, but not limited to, vegetative cover and soils,

(iii) the capacity of the land to carry stock,

(iv) the stock carried on the land at any time, and

(v) constraints which would affect stock carrying capacity in an unimproved state, including physical and legal constraints;

(c) inferences or assertions about the land or its use at any time, including:

(i) inferences made about any of the matters in (b),

(ii) any other inferences related to unimproved carrying capacity, and

(iii) valuations of the land or any element of it;

(d) notions about, or articulations of, unimproved state, including:

(i) notions about unimproved state, (which includes any concept, however described, that requires consideration of land as though it had not been developed as it has been developed),

(ii) as part of valuations or assessments of land value or unimproved value under rating legislation,

(iii) as part of valuations of rental value or the value of land exclusive of improvements under the Crown Pastoral Land Act 1998 or the Land Act 1948,

(iv) as part of case law or valuation practice, and

(v) those used in any documents related to the administration of the pastoral lease under the Crown Pastoral Land Act 1998 or the Land Act 1948.

2.3.2 Exception

Rule 2.3.1 does not apply to the extent that consideration of information is explicitly and necessarily required in the specified process; for example, by rule 2.4.5(a), which requires consideration of whether land is physically accessible.

2.4 The specified process for assessing base carrying capacity

2.4.1 Specified process

(a) The process set out in rule 2.4 is the only process or method that may be used to assess base carrying capacity for leases in Set 2.

(b) Assessors must use, when making estimates or calculations:

(i) the simplest method that is appropriate to the purpose of the rule that requires the estimate or calculation. For example, refer to Table 6 in rule 2.4.4 and Table 7 in rule 2.4.6, and

(ii) annual equivalent stock unit numbers for stock carried on the land for any period in proportion to the part of the year that the stock spends on the land (whether or not that stock is also grazed on any other ground that is not subject to the pastoral lease). For example, refer to Appendix 4.

2.4.2 Steps in the process

Assessors must:

(a) establish, with sufficient accuracy, the boundaries of the pastoral lease,

(b) determine if there is a boundary variation between the modelled area and the area of the pastoral lease established under (a),

(c) estimate whether it is reasonably possible that the area discrepancy threshold (as defined in rule 2.4.3) is exceeded and, if so, make the determination in rule 2.4.4(b),

(d) estimate whether it is reasonably possible that the isolation/access threshold in rule 2.4.5(a) is exceeded and, if so, make the determinations in rule 2.4.6(b), and

(e) use Table 8 in rule 2.4.7 to calculate the base carrying capacity of the pastoral lease.

2.4.3 Area discrepancy threshold

The area discrepancy threshold is exceeded if the modelled area differs from the area of the pastoral lease, to the extent that if Model 2 were applied to the area of the pastoral lease, it would produce a base carrying capacity which differs by 10 % or more from modelled base.

> **COMMENTARY**
>
> The area of the pastoral lease may differ from the area shown on the title.

2.4.4 Process for estimating or determining area discrepancy

(a) Assessors must estimate if it is reasonably possible that the area discrepancy threshold is exceeded and, if so, determine whether the area discrepancy threshold is actually exceeded.

(b) If the area discrepancy threshold is actually exceeded, assessors must:

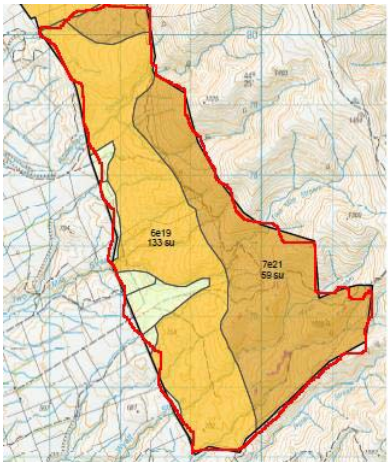
(i) (unless rule 2.4.1(b) requires a different method) use the table and map or maps in rule 2.1.2(a)(iv) and (v) showing BASE (in stock units) shown on LUC units, and

(ii) determine the BASE (in stock units) that Model 2 would produce if it were applied to the area of the pastoral lease.

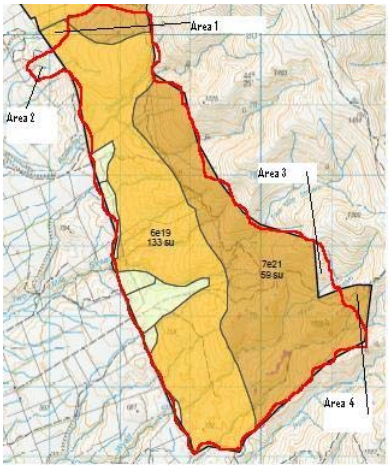
COMMENTARY

- Assessors may need to approximate the pastoral lease area using revised boundaries, for example refer Table 6.
- An example of a different method would be an assessor considering another assessor's workings during dispute resolution, and if they agree, then adopting those workings.

Table 6

Legend	
	Modelled Area Boundary
	Pastoral Lease Boundary
	**Example One:** **Where area differences do not exceed threshold** The pastoral lease boundary and modelled area boundary are very similar. Therefore it is **not** reasonably possible that the 10 % threshold is exceeded.

Legend	
	Modelled Area Boundary
	Pastoral Lease Boundary

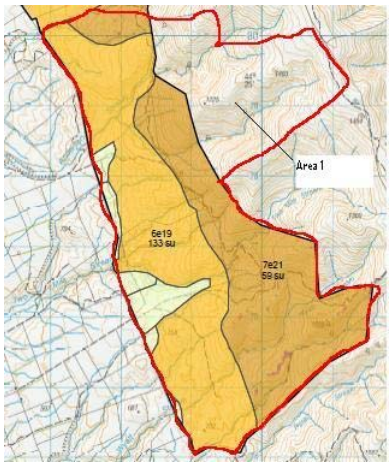


Example Two:

Where area differences do not exceed threshold

- Area 1 is outside lease boundary but included in modelled base.
- Area 2 is inside lease boundary but not included in modelled base.
- Area 3 is inside lease boundary but not included in modelled base.
- Area 4 is outside lease boundary but included in modelled base.
- Areas 1 and 2 are similar in area, LUC unit and BASE/ha.
- Areas 3 and 4 are similar in area, LUC unit and BASE/ha.

Therefore it is **not** reasonably possible that the 10 % threshold is exceeded.



Example Three:

Where area differences exceed threshold and determination is required

Area 1 is inside lease boundary but not included in modelled base.

Therefore a large area exceeding threshold is reasonably possible.

Steps:

1. Estimate land area in Area 1.
2. Ascertain LUC unit (assume unit 7 in this case).
3. Adopt BASE SU/ha rate for similar LUC unit (from Table 5).
4. Multiply step 1 by step 3 to arrive at an estimate of BASE for Area 1.
5. Determine if this causes the area discrepancy threshold of 10 % to be exceeded.

2.4.5 Isolation / access threshold

(a) The isolation/access threshold is exceeded if the summation of the individual BASE (in stock units) produced on LUC units by Model 2 for all relevant areas is 10 % or more of modelled base.

(b) An area is a relevant area for the purposes of this rule if it:

(i) is assigned an LUC unit of 1, 2, 3, 4, 5, or 6, in the relevant authoritative dataset, and

(ii) is so isolated that it is not physically accessible for stock, either through the pastoral lease, or other land.

2.4.6 Process for estimating or determining isolation / access

Assessors must estimate if it is reasonably possible that the isolation/access threshold is exceeded and, if so, determine whether the isolation/access threshold is in fact exceeded and, if so:

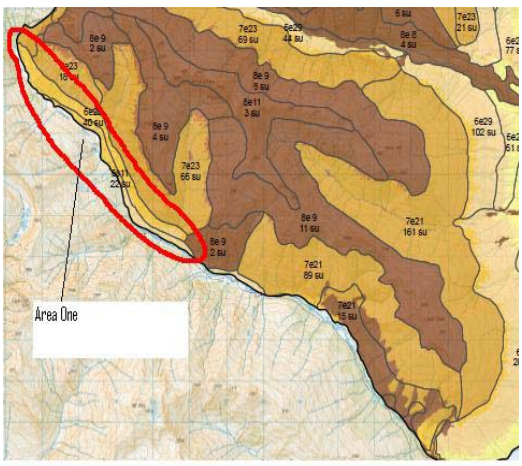
(a) (unless rule 2.4.1(b) requires a different method) use the table and map or maps in rule 2.1.2(a)(iv) and (v) , and

(b) determine the modelled base (in stock units) produced by the model for all relevant areas.

COMMENTARY:

An example of a different method would be an assessor considering another assessor's workings and, if they agree, then adopting those workings.

Table 7



Example:

Where the isolation / access differences do not exceed threshold

Steps:

1. Identify areas of modelled base that satisfy criteria set out in rule 2.4.5(b)(i) and 2.4.5(b)(ii).
2. Area One meets criteria by being LUC unit 6 and meeting isolation/access criteria.
3. Identify BASE for this area (40 SU and 22 SU in this case)

   (In this case, modelled base is 2200)
4. Determine if this causes the isolation/access threshold to be exceeded.
5. 62 SU is less than 10 % of 2200 SU therefore threshold is **not** exceeded.

2.4.7 Calculating base carrying capacity

Assessors must calculate base carrying capacity according to Table 8 below.

Table 8

Case	Area discrepancy threshold is exceeded?	Isolation / access threshold is exceeded?	How base carrying capacity must be assessed
1	no[1]	no[2]	Base carrying capacity is modelled base
2	yes	no[2]	Base carrying capacity is the result of the determination required by rule 2.4.4
3	no[1]	yes	Base carrying capacity is modelled base less the result of the determination required by rule 2.4.6
4	yes	yes	Base carrying capacity is the result of the determination required by rule 2.4.4 less the result of the determination required by rule 2.4.6

[1] Either, because under rule 2.4.4(a) it has been estimated that it is not reasonably possible that the area discrepancy threshold is exceeded, or it has actually been determined that the area discrepancy threshold has not been exceeded.

[2] Either because under rule 2.4.6(a) it has been estimated that it is not reasonably possible that the isolation/access threshold is exceeded, or it has actually been determined that the isolation/access threshold is not exceeded.

3 Assessment of base carrying capacity for leases in Set 3

3.1 Information from the Commissioner

The Commissioner must provide or refer assessors to:

(a) available information describing or showing the boundaries of the pastoral lease, and

(b) the information prescribed in rule 3.2 (in this rule 3 called the 'Valuer-General data').

3.2 Valuer-General data

(a) The Valuer-General data must:

(i) cover an area (in this rule 3 called the 'mapped area') which substantially corresponds to the area of the pastoral lease;

(ii) be taken from the relevant authoritative datasets (refer Appendix 3);

(iii) be published by the Valuer-General;

(iv) include a table (refer to Table 9 below for example) that shows the following information:

(A) all types of LUC units that exist in the mapped area,

(B) the area (in hectares) of each polygon delimiting each instance of each LUC unit referred to in (i),

(C) the soil type derived from New Zealand Land Resources Inventory that is ascribed to the instances of LUC unit in (ii) and described in *General Survey of the soils of the South Island of New Zealand*, New Zealand Soil Bureau Bulletin 27, Department of Scientific and Industrial Research 1968,

(D) an identifier of each polygon referred to in (B),

(E) mean annual soil temperature,

(F) vapour pressure deficit in January,

(G) elevation (mean altitude), and

(H) aspect.

Table 9

The following is an example of a table for an individual lease:

Polygon Identifier	LUC unit	Soil Type	Mean altitude (metres)	mean aspect (degrees)	mean soil temp (celsius)	Mean Vpd (Jan) (Kpa)	Hectares
1	2s 1	98f	217	6	12	59	17.31
2	4s 1	98f	240	21	12	63	1.28
3	4s 1	98f	291	22	11	61	1.76
4	4s 1	98f	241	20	12	62	77.99
5	4s 1	98f	220	10	12	60	97.00
6	6e29	57c	337	108	9	60	22.54
7	6e29	57c	381	67	10	58	156.71
8	6e29	57c	495	45	10	54	190.80
9	6e29	57c	564	74	9	52	28.00
10	6e29	57c	588	112	8	50	180.93
11	6e29	57c	374	77	9	55	117.67
12	6e29	57c	462	86	9	53	391.41
13	6e29	57c	632	96	8	48	204.46
14	6e29	57c	447	63	9	53	453.19
15	6e29	57c	535	103	8	50	325.48
16	6e29	57c	635	63	8	47	127.27
17	6e29	57c	366	35	11	55	16.04
18	7e12	24a	350	109	9	60	0.42
19	7e23	57c	240	27	12	62	2.27
20	7e23	57c	808	45	8	45	212.83
21	7e23	57c	416	65	10	56	215.74
22	7e23	57c	820	93	7	42	72.26
23	7e23	57c	732	143	6	45	134.33
24	7e23	57c	812	103	7	43	148.07

(v) include maps (capable of rendering at A3) which display as far as practicable, the information in rule 3.2 overlaid on a recent topographic map or recent high resolution imagery of the mapped area; and

(vi) include a map, or maps (capable of rendering at A3), depicting the mapped area boundaries and, from available information, the apparent boundary of the pastoral lease.

(b) The mapped area must be that in the column so headed in Table 13, Appendix 3 unless a revised figure has been published by the Valuer-General.

COMMENTARY

If the mapping is run again in the future, as described in rule 3.2(b) and is published by the Valuer-General, a new mapped area would be produced and then be used in assessments.

3.3 Information that must be used in the process to assess base carrying capacity

The following must be used in the process for assessing base carrying capacity for leases in Set 3:

(a) information to which the Commissioner has referred the assessor under rule 3.1,

(b) information in rule 3.2, and

(c) information relevant to the process for assessing base carrying capacity and which is revealed in steps under s 23C to 23H(1)(a), up to the time the assessment is made.

COMMENTARY

- It is intended that information from the lessee (or representative) under s 23D(2) would form part of the consideration of the Crown's assessor.
- The steps in ss 23E to 23H(1)(a) involve the possibility of reconsideration and revisiting the elements of the specified process or the result. For example, relevant information may come from the other assessors' processes or information, relevant new information about the land, or advice from the expert determiner.

3.4 Information that must not be used in the process to assess base carrying capacity

3.4.1 Information not to be used

The following information about the land must not be used to assess base carrying capacity:

(a) differences between the facts and the Valuer-General data, including:

(i) any difference between any characteristic of the land and the values for that characteristic in the authoritative datasets used in the Valuer-General data, and

(ii) that any area could be assigned to a different LUC unit or units than that to which it is assigned in the relevant authoritative dataset used in the Valuer-General data;

(b) facts about the land or its use at any time, including:

(i) the physical characteristics of the land other than those for which values exist in the authoritative datasets used in the Valuer-General data,

(ii) the state of the land at any time including, but not limited to, vegetative cover and soils,

(iii) the capacity of the land to carry stock,

(iv) the stock carried on the land at any time, and

(v) constraints which would affect stock carrying capacity in an unimproved state, including physical and legal constraints;

(c) inferences or assertions about the land or its use at any time, including:

(i) inferences made about any of the matters in (b),

(ii) any other inferences related to unimproved carrying capacity, and

(iii) valuations of the land or any element of it;

(d) notions about, or articulations of, unimproved state, including:

(i) notions about unimproved state, (which includes any concept, however described, that requires consideration of land as though it had not been developed as it has been developed),

(ii) as part of valuations or assessments of land value or unimproved value under rating legislation,

(iii) as part of valuations of rental value or the value of land exclusive of improvements under the Crown Pastoral Land Act 1998 or the Land Act 1948,

(iv) as part of case law or valuation practice, and

(v) those used in any documents related to the administration of the pastoral lease under the Crown Pastoral Land Act 1998 or the Land Act 1948.

3.4.2 Exception

Rule 3.4.1 does not apply to the extent that consideration of information is explicitly and necessarily required in the specified process; for example, by rule 3.5.5(c)(i) which may require consideration of the effects of burning and regeneration.

3.5 The specified process for assessing base carrying capacity

3.5.1 Specified process

(a) The process set out in rule 3.5 is the only method or process that may be used to assess base carrying capacity for leases in Set 3.

(b) Assessors must use, when making estimates or calculations:

(i) the simplest method that is appropriate to the purpose of the rule that requires the estimate or calculation. For example, refer to Table 2.

(ii) annual equivalent stock unit numbers for stock carried on the land for any period in proportion to the part of the year that the stock spends on the land (whether or not that stock is also grazed on any other ground that is not subject to the pastoral lease). For example, refer to Appendix 4.

3.5.2 Steps in process

Assessors must:

(a) establish, with sufficient accuracy, the boundaries of the pastoral lease,

(b) determine if there is a boundary variation between the mapped area and the area of the pastoral lease established under (a),

(c) estimate whether it is reasonably possible that the area discrepancy threshold (as defined in rule 3.5.3) is exceeded and, if so, determine how to proceed under rule 3.5.4,

(d) construct a notional state for the land as specified by rules 3.5.5 and 3.5.6, and

(e) calculate the base carrying capacity in accordance with rule 3.5.7.

3.5.3 Area discrepancy threshold

The area discrepancy threshold is exceeded if the mapped area differs from the area of the pastoral lease, to the extent that if a base carrying capacity were applied to the area of the pastoral lease, it would produce a base carrying capacity which differs by 10 % or more from the total base carrying capacity the assessor thinks is likely to be calculated.

> **COMMENTARY**
>
> The area of the pastoral lease may differ from the area shown on the title.

3.5.4 Process for estimating or determining the area discrepancy

(a) Assessors must estimate if it is reasonably possible that the area discrepancy threshold is exceeded and, if so, determine whether the area discrepancy threshold is actually exceeded.

(b) With the exception of the lease listed in (c), if the area discrepancy threshold is actually exceeded, assessors must:

(i) use the table and map, or maps, in rule 3.2, and

(ii) determine the base carrying capacity (in stock units) by applying rules 3.5.5 and 3.5.6 to the area of the pastoral lease.

> **COMMENTARY**
>
> - Assessors may need to approximate the pastoral lease area based on revised boundaries, for example refer Table 6.
> - An example of a different method would be an assessor considering another assessor's workings during dispute resolution, and if they agree, then adopting those workings.

(c) For the following lease, the mapped area must be used in the assessment of base carrying capacity, regardless of the area of the pastoral lease:

- Lower Cascade

3.5.5 Constructing a notional state for the land

Assessors must, when constructing a notional state for the land:

(a) use the Valuer-General data;

(b) adopt the soil types for each LUC unit from the relevant column in Table 9 above;

(c) use, as the land cover of the notional state, the native vegetation listed against the soil type adopted under (b) in the extended legend in General Survey of the soils of the South Island of New Zealand, New Zealand Soil Bureau Bulletin 27, Department of Scientific and Industrial Research 1968, as adopted by (b);

(d) assume only the following changes to the vegetative state, established under (c):

(i) vegetation has been burnt and regenerated, where this would sustainably improve the ability of the land to carry stock, and

(ii) there is no impact on the vegetation from animal or plant pests.

3.5.6 Assumptions about stock in the notional state

Assessors must, when calculating the stock unit numbers that the land would carry sustainably in the notional state, assume that:

(a) stock are constrained within the pastoral lease,

(b) modern stock genetics and management techniques are in place,

(c) stock can be accessed and moved on and off the pastoral lease from surrounding land, with the surrounding land being in its currently developed state, and

(d) the stock carried is zero in areas that are so isolated that it is not physically accessible for stock, either through the pastoral lease, or other land.

3.5.7 Calculating base carrying capacity

Assessors must, when calculating base carrying capacity:

(a) calculate the base carrying capacity of the notional state by applying a carrying capacity in SU/ha to each LUC.

(b) use annual equivalent stock unit numbers for stock carried on the land for any period in proportion to the part of the year that the stock spends on the land (whether or not that stock is also grazed on any other ground that is not subject to the pastoral lease). For example, refer to Appendix 4.

(c) ensure that base carrying capacity calculated in (a) is not:

(i) more than the maximum base carrying capacity in the columns so headed in Table 13, Appendix 3, unless a revised figure has been published by the Valuer-General, or

(ii) less than the minimum base carrying capacity in the columns so headed in Table 13, Appendix 3, unless a revised figure has been published by the Valuer-General.

4 Assessment of current carrying capacity

4.1 Information for assessing current carrying capacity

4.1.1 Information from the Commissioner

The Commissioner must provide or refer assessors to:

(a) information as set out in Table 10 below; and

Table 10

For leases that are in…	Refer assessors to information in…
Set 1…	rules 1.1.2(a)(iv),(v) and (vi)
Set 2…	rules 2.1.2(a)(iv),(v) and (vi)
Set 3…	rules 3.2(a)(iv), (v) and (vi)

(b) where available, extracts from reports (see examples in commentary box below) completed within the last five years that show any of the following:

(i) stock carried at any time,

(ii) how efficiently the land is being farmed,

(iii) developments on the land,

(iv) the stock carrying capacity of the land, and

(v) applications and decisions made under ss 9, 15, and 16.

COMMENTARY

Examples of appropriate reports the Commissioner may provide extracts from under rule 4.1.1(b) are:

- personal stock exemptions,
- tenure review valuations,
- rent review valuations,
- property inspection reports, and
- applications for burning and disturbance of the soil.

4.1.2 Information from lessees

Assessors must request the following information from lessees; that is, details of:

(a) stock reconciliations that attach to the trading accounts for the last five years,

(b) production and performance of stock carried in each of the last five years and the reasons for any significant variation,

(c) any stock farmed in conjunction with other land, outside the pastoral lease,

(d) any other inputs/supplements; for example, feed,

(e) any other land management and development information, and

(f) any other land farmed in conjunction with the pastoral lease.

COMMENTARY

Examples of information lessees could provide under rule 4.1.2 are:

- soil test reports,
- soil fertility reports,
- fertiliser history,
- farm development plans, and
- farm paddock maps.

4.2 The specified process for assessing current carrying capacity

4.2.1 Specified process

(a) The process set out in rule 4.2 is the only method or process that may be used to assess current carrying capacity.

(b) Assessors must use, when making estimates or calculations:

(i) the simplest method that is appropriate to the purpose of the rule that requires the estimate or calculation, and

(ii) annual equivalent stock unit numbers for stock carried on the land for any period in proportion to the part of the year that the stock spends on the land (whether or not that stock is also grazed on any other ground that is not subject to the pastoral lease). For example, refer to Appendix 4.

4.2.2 Steps in process

Assessors must:

(a) establish, with sufficient accuracy, the boundaries of the pastoral lease,

(b) determine if there is a boundary variation between the mapped area and the area of the pastoral lease established under (a),

(c) estimate whether it is reasonably possible that the area discrepancy threshold (as defined in rule 4.2.3) is exceeded and, if so, determine how to proceed under rule 4.2.4, and

(d) calculate current carrying capacity in accordance with rule 4.2.5.

4.2.3 Area discrepancy threshold

The area discrepancy threshold is exceeded if the mapped area differs from the area of the pastoral lease, to the extent that if a current carrying capacity were applied to the area of the pastoral lease, it would produce a current carrying capacity which differs by 10 % or more from the total current carrying capacity the assessor thinks is likely to be calculated.

> **COMMENTARY**
>
> The area of the pastoral lease may differ from the area shown on the title.

4.2.4 Process for estimating or determining area discrepancy

Assessors must estimate if it is reasonably possible that the area discrepancy threshold is exceeded and, if so, determine whether the area discrepancy threshold is actually exceeded.

(a) With the exception of the leases listed in (b) assessors must use the:

(i) mapped area if the area discrepancy is not exceeded, or

(ii) area of the pastoral lease if the area discrepancy is exceeded.

> **COMMENTARY**
>
> Assessors may need to approximate the pastoral lease area based on revised boundaries, for example refer Table 6.
>
> An example of a different method would be an assessor considering another assessor's workings during dispute resolution, and if they agree, then adopting those workings.

(b) For the following leases, the mapped area must be used in the assessment of current carrying capacity, regardless of the area of the pastoral lease:

- Lower Cascade
- Lilybank
- Glentanner Pt139 and Pt106
- Huxley Gorge Pt139
- Breast Hill
- The Branches
- Earnslaw

4.2.5 Calculating current carrying capacity

When assessing current carrying capacity, assessors must:

(a) use the concept of average efficient based on the stock carrying capacity achieved by a farm lying between the 60th and the 70th percentile of productivity on similar farms (whether pastoral leases or not) and make reasonable assumptions about:

(i) typical access to capital and investment,

(ii) district norms regarding land and structural development, and

(iii) the necessary resource consents under the Resource Management Act 1991 and consents from the Commissioner for average efficient operation having been sought and granted;

(b) apply best practice in valuation and farm management advisory;

(c) consider the following:

(i) that the land has always been farmed sustainably at average efficient levels,

(ii) the types, class, and numbers of stock carried in each of the last five years and the reasons for any significant variations,

(iii) production and performance of stock carried in each of the last five years and the reasons for any significant variations,

(iv) how parts of the pastoral lease are grazed over each year,

(v) the specific effects of weeds and pests,

(vi) current level of land development,

(vii) current level of structural development,

(viii) areas of the property that are unable to be stocked,

(ix) areas of the property where stocking is restricted due to arrangements that would bind a bona fide purchaser of the lease and have been explicitly consented to by the Commissioner,

(x) constraints on stocking created by the obligations under the lease or statutes affecting the lease,

(xi) constraints on stocking created by controls under the Resource Management Act 1991, and

(xii) make reasonable assumptions about specific consents that would be sought and granted, under (x) and (xi);

(d) information from the Commissioner and lessees provided under rules 4.1.1 and 4.1.2; and

(e) information relevant to the process for assessing current carrying capacity and which is revealed, at any stage, in steps under ss 23C to 23H(1)(a), up to the time the assessment is made.

COMMENTARY

- It is intended that information from the lessee (or representative) under s 23D(2) would form part of the consideration of the Crown's assessor.
- The steps in ss 23E to 23H(1)(a) involve the possibility of reconsideration and revisiting the elements of the specified process or the result. For example, relevant information may come from the other assessors' processes or information, relevant new information about the land, or advice from the expert determiner.

5 Requirements for designation as an assessor or expert determiner

5.1 Assessor minimum requirements

(a) To be considered for designation as an assessor under s 23P, potential assessors must:

(i) hold a university-accredited qualification in at least one of the following areas:

(A) agriculture,

(B) farm management,

(C) rural valuation, or

(D) any other degree or post-graduate diploma that the Valuer-General may approve from time to time, and;

(ii) hold at least one of the following professional registrations:

(A) be a registered Valuer under the Valuers Act 1948, or

(B) be registered by the Primary Industry Consultants Registration Board and a member of the New Zealand Institute of Primary Industry Management; and

(iii) in the opinion of the Valuer-General, demonstrate a sufficient level of expertise in valuing pastoral land, or advising lessees and managers of pastoral land, with a minimum of five years' experience.

(b) To be considered for designation as an assessor under s 23P, and only for the purpose of assessment of the base or current carrying capacity under s 23F of their own pastoral lease or one that they actively manage, potential assessors must meet at least one of the following requirements:

(i) the minimum requirements in (a), or

(ii) in the opinion of the Valuer-General, have proven experience and the ability to objectively consider productive and economic aspects of the individual pastoral lease under consideration.

5.2 Restrictions to designations

(a) The Valuer-General may separately approve the extent of any individual designation in respect of assessing base carrying capacity for leases in Sets 1, 2, and 3 and current carrying capacity.

5.3 Expert determiner minimum requirements

To be considered for designation as an expert determiner under s 23F, potential expert determiners must:

(a) meet the minimum requirements for assessors specified in rule 5.1(a), and

(b) in the opinion of the Valuer-General, demonstrate a sufficient level of experience in valuing pastoral land, or advising lessees and managers of pastoral land, with a minimum of 15 years' experience.

5.4 Proof of qualifications

Assessors or expert determiners must, in their application for designation, provide the Valuer-General with the following:

(a) evidence of the educational and experience requirements specified in rule 5.1, and

(b) evidence of membership of the appropriate professional bodies specified in rule 5.1.

6 Dispute resolution

6.1 Notice to accept or reject initial assessment of base or current carrying capacity

The lessee must accept or reject the initial assessment of the base or current carrying capacity and that notice of acceptance/rejection must:

(a) be recorded in Form 1, Appendix 6,

(b) contain the information requested in the form, and

(c) be submitted to the Commissioner.

6.2 Documentation of decisions

Where a lessee has rejected the assessor's initial assessment:

(a) the assessments of the lessee's assessor and the Crown's assessor must:

(i) be recorded in Forms 2a, 2b, 2c, 2d, Appendix 6 (using the form appropriate to the Set the pastoral lease is in and the form appropriate to whether the dispute relates to base or current carrying capacity),

(ii) contain the information requested in the form, and

(iii) be provided to the other assessor;

(b) the base or current carrying capacity set by the expert determiner must:

(i) be recorded in Form 3, Appendix 6,

(ii) contain the information requested in the form, and

(iii) be provided to the Valuer-General, the Commissioner, the lessee, and the assessors.

Appendix 1: Model 1 and Set 1

Model 1

Determine the value for BASE produced by the following formula applied to 25mx25m cells.

BASE = Fmask x exp(1.4899984+(elevation X -0.0006978)+(aspect180 X -0.0019576) +(mean annual soil temperature X -0.0077331 + LUC class value+(VPD_January X 0.0085309))

Where:

elevation is a value in metres above sea level.

aspect180 is a value in degrees from 0° to 180° where north is 0°, east and west are considered equivalent (both 90°), and south is 180° and areas with a slope of less than 7° are treated as flat and aspect180 is 0°.

mean annual soil temperature is a value in degrees Celsius taken from the relevant authoritative dataset.

LUC class value is the coefficient in the table below that corresponds to the LUC class ascribed to the area in the relevant authoritative dataset.

LUC class	Value
1	0
2	0
3	-0.6819865
4	-1.0584458
5	-1.5318441
6	-2.0197741
7	-2.6343372
8	-4.9307393

VPD_January is a value in kilopascals (kPa) for mean vapour pressure deficit in January taken from the relevant authoritative dataset.

Fmask is a variable which is 0 if the area of the cell is shown as any of the following in the authoritative dataset: indigenous forest, river beds, water bodies, glaciers, or permanent snow, and otherwise is 1**.**

And use the result to obtain the BASE output produced by the formula according to the following:

Purpose	Examples of this purpose in these rules	How to output BASE for the purpose
For making maps showing BASE in SU attributed by this model to the areas of instances of LUC unit	Rule 1.1.2(a)(iv)	Use the values for base produced by the formula to calculate mean BASE/ha for the instance of the LUC unit and then multiply it by the area of the instance of the LUC unit in ha, round the result to the nearest 1 stock unit
For producing mean BASE in SU/ha for all instances of an LUC unit	Rule 1.1.2(a)(iv)	Use the values for base produced by the formula to calculate mean BASE/ha for all instances of the LUC unit and round the result to the nearest 0.01 SU/ha
When producing total BASE stock units for a modelled area substantially corresponding to a pastoral lease	Rule 1.1.2(a)(iv)(i)(E)	Use the values for base produced by the formula calculate mean BASE/ha for the modelled area and multiply it by the area of the modelled area in ha, round the result to the nearest 1 SU/ha

Authoritative datasets

VALUE or other component of Model 1	Relevant authoritative dataset	Where the dataset can be obtained
Elevation	Landcare 25m digital elevation model (DEM), version 2003	http://lris.scinfo.org.nz/#/layer/322-elevation/
Aspect180	A 25m gridded layer derived from Landcare Research 25m digital elevation model, version 2003	The 25m gridded layer is available at: http://lris.scinfo.org.nz/#/layer/313-aspect-aspect180/
Mean January Vapour pressure deficit	A 25m gridded layer derived by re-sampling (with bilinear interpolation) from the 100m gridded layer for 30 year normals to 1980 from Land Environments of New Zealand (LENZ)	The 25m gridded layer is available at: http://lris.scinfo.org.nz/#/layer/321-mean-january-vapour-pressure-deficit-vpdjan/

<table>
<tr><th>VALUE or other component of Model 1</th><th>Relevant authoritative dataset</th><th>Where the dataset can be obtained</th></tr>
<tr><td>Mean Annual Soil Temperature</td><td>A 25m gridded layer described in Barringer and Lilburne (2000)</td><td>The 25m gridded layer is available at:

http://lris.scinfo.org.nz/#/layer/319-mean-annual-soil-temperature-styear/</td></tr>
<tr><td>LUC class</td><td>LUC class from New Zealand Land Resource Inventory.

A 25m gridded dataset converted from the polygon format of the New Zealand Land Resource Inventory, substituting the coefficients.</td><td>The 25m gridded layer is available at:

http://lris.scinfo.org.nz/#/layer/315-luc-coefficient-model-1/

The original vector land use capability data is at:

http://lris.scinfo.org.nz/#/layer/76-nzlri-land-use-capability/</td></tr>
<tr><td>Fmask</td><td>A 25m gridded dataset derived from Land Cover Database (LCDB2) where the following land cover classes are set to 0, and all others to 1.

<table><tr><th>Class</th><th>Name</th></tr><tr><td>65</td><td>indigenous forest</td></tr><tr><td>54</td><td>broadleaved indigenous hardwoods</td></tr><tr><td>20</td><td>lake or pond</td></tr><tr><td>21</td><td>river</td></tr><tr><td>14</td><td>permanent snow and ice</td></tr><tr><td>16</td><td>gravel and rock</td></tr></table></td><td>A 25m gridded layer showing all the cells forced to 0 is available at:

http://lris.scinfo.org.nz/#/layer/314-zero-base-mask-fmask/</td></tr>
</table>

Set 1: Leases for which base carrying capacity must use Model 1

(a) The modelled base has been produced using Model 1 on modelled area.

(b) The modelled area substantially corresponds with the area of the pastoral lease.

(c) Changes to this table may be made subsequent to publication of the Rules and can be found at www.linz.govt.nz, as per rule 1.1.2(b).

Table 11: Set 1 leases

LEASE	LINZ ID	Modelled Area (Ha)	Modelled Base (SU)
Airies	12707	1,661	416
Ardross Station	12653	3,277	1,073
Argyle Station	12658	13,902	2,845
Asheridge	12797	2,091	359
Aviemore Station	12461	12,731	1,985
Awapiri Station	12634	6,871	1,090
Balmoral Po265	12541	4,486	948
Bargour	12607	3,946	929
Bauchops Hill	12704	2,004	518
Beaumont Po362	12602	20,906	3,791
Beaumont Ps091	12665	3,370	1,701
Bellamore	12502	2,234	297
Ben McLeod	12693	13,736	1,368
Ben Nevis	12522	14,756	2,355
Birdwood	12505	3,034	538
Black Forest	12725	7,951	1,331
Blue Mountain	12687	9,414	1,595
Bog Roy	12567	2,849	1,203
Breast Hill	12510	7,999	1,260
Brooksdale	12778	3,270	607
Burgan Run	12451	5,479	1,386
Bush Spurs	12781	258	55
Caberfeidh	12732	2,113	587
Caithness	12595	2,183	523
Camden	12645	7,655	1,226

LEASE	LINZ ID	Modelled Area (Ha)	Modelled Base (SU)
Carrick Station	12597	9,320	1,427
Castle Hill	12748	2,632	943
Cecil Peak Station	12649	13,266	1,364
Chetwynd	12714	789	92
Clent Hills	12769	2,183	736
Cloudy Peaks	12685	1,687	415
Clover Flats	12565	2,137	691
Cluden Station	12507	12,222	2,419
Coal Creek Station	12464	1,115	268
Courthill	12617	943	162
Craigroy	12517	4,405	792
Crown Rock Station	12466	3,676	729
Curraghmore	12672	6,055	1,047
Deep Creek	12437	2,678	693
Dry Creek	12786	13,997	2,585
Dunstan Burn	12445	5,076	1,343
Dunstan Downs	12432	12,294	1,415
Earnslaw Station	12440	6,822	671
Emerald Hills	12482	970	137
Erewhon	12784	13,761	1,012
Eskhead	12764	15,616	2,081
Eweburn	12448	2,562	470
Ferintosh	12690	2,613	706
Forest Range	12509	5,466	1,212
Galloway Station	12489	11,242	2,552
Gem Lake	12465	5,409	691
Glen Lyon	12673	31,851	2,959
Glenaray Station	12422	50,637	7,406
Glencairn	34167	3,971	1,104
Glencoe Po144	12475	8,050	1,233
Glencoe Po366	12606	1,908	648
Glenfalloch	12777	10,784	1,228

LEASE	LINZ ID	Modelled Area (Ha)	Modelled Base (SU)
Glenhope	12770	9,893	1,335
Glenmore Station	12669	17,508	1,928
Glenrock Pc140	12782	7,075	674
Glenrock Pt084	12703	3,892	1,251
Glentanner Ot045	12737	435	133
Glentanner Pt006	12789	3,564	898
Glenthorne	12754	10,300	1,061
Glynn Wye Station	12745	20,882	2,082
Gorge Creek	12456	2,249	351
Gorge Farm	12582	286	69
Grange Hill	12711	1,500	231
Halfway Bay Station	12654	16,896	1,576
Happy Valley	12601	3,268	588
Hawksburn Station	12439	7,070	1,257
Holbrook	12727	7,179	1,681
Hossack	12763	9,049	1,246
Hukarere	12431	6,888	1,542
Hunter Hills	12702	2,684	522
Hunter Valley Station	12488	7,638	1,350
Huxley Gorge Pt106	12718	6,812	152
Huxley Gorge Pt139	12735	6,695	781
Invercroy	12731	2,464	652
Island Hills	12750	5,000	286
Islay Downs	12603	1,523	239
Kawarau Station	12518	4,813	915
Kelvin Grove	12548	2,446	611
Kingston Station	12655	5,670	1,058
Kinross	12588	2,058	409
Kirkliston	12726	7,510	1,281
Lake Taylor	12766	7,406	1,135
Lauder Station	12615	4,297	1,081
Leaning Rock	12485	2,408	486

LEASE	LINZ ID	Modelled Area (Ha)	Modelled Base (SU)
Lilybank Station	12788	2,796	572
Little Mt Ida	12574	2,370	751
Little Valley	12594	10,858	1,849
Loch Linnhe	12515	11,188	1,644
Lochaber	12696	10,069	1,520
Long Gully	12444	1,677	651
Longlands Station	12536	2,072	648
Lorne Peak	12668	5,517	2,134
Lowburn Valley	12532	5,819	1,065
Manahune	12708	1,255	334
Manuka Point	12758	7,447	374
Matakanui Station	12576	3,619	395
Matangi	12610	11,185	1,762
Middle Hill Station	12792	3,230	689
Middlehurst	12798	11,173	827
Minaret Station	12545	19,896	2,405
Moa Hills	12570	3,567	478
Morven Hills	12599	14,213	3,197
Motatapu Station	12478	17,460	2,567
Moutere Station	12600	2,390	622
Mt Albert Station	12573	11,042	1,256
Mt Alexander	12549	3,898	702
Mt Algidus	12752	21,281	1,875
Mt Arrowsmith	12742	8,166	1,448
Mt Benger	12524	1,669	369
Mt Burke Station	12447	9,886	2,702
Mt Campbelll	12596	8,570	1,690
Mt Creighton Station	12459	16,333	1,880
Mt Dalgety	12670	7,520	1,079
Mt Dasher	12435	7,158	1,418
Mt Difficulty	12593	5,272	1,034
Mt Gerald	12675	6,226	1,792

LEASE	LINZ ID	Modelled Area (Ha)	Modelled Base (SU)
Mt Grand	12589	1,977	361
Mt Hay	12691	10,881	1,701
Mt Hutt	12756	2,317	360
Mt Nicholas Station	12420	36,773	5,710
Mt Nimrod	12710	1,807	336
Mt Oakden	12767	3,402	501
Mt Olympus	12755	5,005	114
Mt Pember	12747	8,145	1,381
Mt Soho Station	12583	7,554	1,073
Mt St Bathans	12462	9,191	1,558
Mt Stalker	12584	5,616	1,311
Mt White	12762	38,058	5,400
Nokomai Station	12662	32,967	4,718
Omahau Hill	16640	2,293	532
Omarama Station	12608	8,850	2,419
Otematata Po304	12561	12,778	2,139
Otematata Po305	12562	12,906	2,566
Ramshead Run	12641	2,348	480
Rata Peaks	12697	1,814	458
Rees Valley Station	12568	19,147	1,207
Ribbonwood	12525	7,306	2,242
Riverside	12611	5,126	1,051
Robrosa	12529	3,723	436
Rollesby	12720	2,607	664
Rostriever	12566	3,509	1,002
Shag Valley Station	12579	1,989	493
Shenley	12684	3,238	578
Shingley Creek	12436	811	147
Shortlands Station	12555	5,049	1,458
Snowdale	12765	5,923	758
Stoneleigh	12686	2,897	466
Stony Creek	12724	7,663	1,570

LEASE	LINZ ID	Modelled Area (Ha)	Modelled Base (SU)
Streamlands	12713	5,827	1,574
Styx Run	12580	3,089	506
Sunny Peaks	12535	2,700	517
Sunset Farm	12572	1,637	262
Te Akatarawa	12683	11,486	2,268
The Beeches I	12486	1,031	267
The Beeches II	12506	2,227	261
The Branches Po313	12569	20,255	2,752
The Dasher	12434	6,222	1,393
The Forks	12457	1,458	323
The Herrons	12472	1,992	412
The Jollies	12657	1,166	331
The Jordan	12647	1,861	393
The Lakes	12768	4,331	943
The Poplars	12743	2,320	533
The Wandle	12577	1,274	528
Three Springs	12721	871	212
Totara Peak	34170	4,970	1,191
Twin Peaks	12501	3,535	1,022
Two Mile	12453	3,048	715
Upcot Station	12639	8,012	776
Upper Lake Heron	12746	18,334	2,583
Waipiata Syndicate	12508	1,134	138
Wairua Downs	12694	2,938	539
Waitangi	12698	19,343	3,395
Whitecoomb Po374	12613	4,208	787
Whitecoomb Ps017	12651	11,434	1,293
Winterslow	12773	9,534	836
Woodstock	12776	2,075	546

Appendix 2: Model 2 and Set 2

Model 2

Determine the value for BASE produced by the following formula applied to 25mx25m cells

BASE = Fmask x exp (-5.971040435 + (slope * 0.017525954) + LUC class value+ (vpd_january * 0.046918408) + (vpdyr * -0.098763683) + (nzmas * 0.043276909))

Where:

LUC class value is the coefficient in the table below that corresponds to the LUC class ascribed to the area in the relevant authoritative dataset.

Where the LUC class is…	**then the coefficient is…**
4…	-0.457559805
5…	-0.027060915
6…	-0.810075484
7…	-1.49966985
8…	-4.017955247

Nzmas is a value in watts per metre square ($W/m^{2)}$ for mean annual solar radiation taken from the relevant authoritative dataset.

VPD_January is a value in kilopascals (kPa) for mean vapour pressure deficit in January taken from the relevant authoritative dataset.

Vpdyr is a value in kPa for mean annual vapour pressure deficit taken from the relevant authoritative dataset.

Fmask is a variable which is 0 if the area of the cell is shown as any of the following in the authoritative dataset: indigenous forest, river beds, water bodies, glaciers, or permanent snow, and otherwise is 1.

And use the result to obtain the BASE output produced by the formula according to the following table:

Purpose	Examples of this purpose in these rules	How to output BASE for the purpose
For making maps showing BASE in SU attributed by this model to the areas of instances of LUC units	Rule 2.1.2(a)(iv)	Use the values for base produced by the formula to calculate mean BASE/ha for the instance of the LUC unit and then multiply it by the area of the instance of the LUC unit in ha, round the result to the nearest 1 stock unit
For producing mean BASE in SU/ha for all instances of an LUC units	Rule 2.1.2(a)(iv)	Use the values for base produced by the formula to calculate mean BASE/ha for the LUC unit and round the result to the nearest 0.01 SU/ha
When producing total BASE stock units for a modelled area substantially corresponding to a pastoral lease	Rule 2.1.2(a)(iv)(E)	Use the values for base produced by the formula calculate mean BASE/ha for the modelled area and multiply it by the area of the modelled area in ha, round the result to the nearest 1 SU/ha

Authoritative datasets

VALUE or other component of Model1	Relevant authoritative dataset	Where the dataset can be obtained
Slope	A 25m gridded layer derived from Landcare Research 25m digital elevation model using a standard slope function to calculate slopes from a neighbourhood of nine (3x3) adjacent cells	The 25m gridded layer is available at: http://lris.scinfo.org.nz/#/layer/318-slope/

VALUE or other component of Model1	Relevant authoritative dataset	Where the dataset can be obtained
Mean January Vapour pressure deficit	A 25m gridded layer derived by re-sampling (with bilinear interpolation) from the 100m gridded layer for 30 year normals to 1980 from Land Environments of New Zealand (LENZ)	The 25m gridded layer is available at: http://lris.scinfo.org.nz/#/layer/321-mean-january-vapour-pressure-deficit-vpdjan/
Mean Annual Vapour pressure deficit	A 25m gridded layer derived by re-sampling (with bilinear interpolation) from the 100m gridded layer for 30 year normals to 1980 from Land Environments of New Zealand (LENZ)	The 25m gridded layer is available at: http://lris.scinfo.org.nz/#/layer/320-mean-annual-vapour-pressure-deficit-vpdyr/
Mean Annual Solar Radiation	A 25m gridded layer derived by re-sampling (with bilinear interpolation) from the 100m gridded layer for 30 year normals to 1980 from Land Environments of New Zealand (LENZ)	The 25m gridded layer is available at: http://lris.scinfo.org.nz/#/layer/317-mean-annual-solar-radiation-nzmas/
LUC class	A 25m gridded dataset converted from the polygon format of the New Zealand Land Resource Inventory	The 25m gridded layer is available at: http://lris.scinfo.org.nz/#/layer/316-luc-coefficient-model-2/ The original vector land use capability data is at: http://lris.scinfo.org.nz/#/layer/76-nzlri-land-use-capability/

<table>
<tr><th>VALUE or other component of Model1</th><th>Relevant authoritative dataset</th><th>Where the dataset can be obtained</th></tr>
<tr><td>Fmask</td><td>A 25m gridded dataset derived from Land Cover Database (LCDB2) where the following land cover classes are set to 0, and all others to 1

<table><tr><th>Class</th><th>Name</th></tr><tr><td>65</td><td>indigenous forest</td></tr><tr><td>54</td><td>broadleaved indigenous hardwoods</td></tr><tr><td>20</td><td>lake or pond</td></tr><tr><td>21</td><td>river</td></tr><tr><td>14</td><td>permanent snow and ice</td></tr><tr><td>16</td><td>gravel and rock</td></tr></table></td><td>A 25m gridded layer showing all the cells forced to 0 is available at:

http://lris.scinfo.org.nz/#/layer/314-zero-base-mask-fmask/</td></tr>
</table>

Set 2: Leases for which base carrying capacity must use Model 2

(a) The modelled base has been produced using Model 2 on modelled area.

(b) The modelled area substantially corresponds with the area of the pastoral lease.

(c) Changes to this table may be made subsequent to publication of these rules and can be found at www.linz.govt.nz, as per rule 2.1.2(b).

Table 12: Set 2 leases

LEASE	LINZ ID	Modelled Area	Modelled Base
Balmoral Pt021 - Tekapo	12681	6,458	1,257
Grays Hills	12689	10,680	1,724
Irishman Creek	12678	10,053	1,948
Maryburn	12688	8,337	1,469
Sawdon	12677	7,655	1,127
Simons Pass	12680	5,593	987
The Wolds	12674	7,966	1,484

Appendix 3: Set 3

Authoritative datasets

VALUE or other component of Model 1	Relevant authoritative dataset	Where the dataset can be obtained
Elevation	Landcare 25m digital elevation model (DEM). Version 2003	http://lris.scinfo.org.nz/#/layer/322-elevation/
Aspect180	A 25m gridded layer derived from Landcare Research 25m digital elevation model, version 2003	The 25m gridded layer is available at: http://lris.scinfo.org.nz/#/layer/313-aspect-aspect180/
Mean January Vapour pressure deficit	A 25m gridded layer derived by re-sampling (with bilinear interpolation) from the 100m gridded layer for 30 year normals to 1980 from Land Environments of New Zealand (LENZ)	The 25m gridded layer is available at: http://lris.scinfo.org.nz/#/layer/321-mean-january-vapour-pressure-deficit-vpdjan/
Mean Annual Soil Temperature	A 25m gridded layer described in Barringer and Lilburne (2000)	The 25m gridded layer is available at: http://lris.scinfo.org.nz/#/layer/319-mean-annual-soil-temperature-styear/
LUC class	LUC class from New Zealand Land Resource Inventory. A 25m gridded dataset converted from the polygon format of the New Zealand Land Resource Inventory, substituting the coefficients.	The 25m gridded layer is available at: http://lris.scinfo.org.nz/#/layer/315-luc-coefficient-model-1/ The original vector land use capability data is at: http://lris.scinfo.org.nz/#/layer/76-nzlri-land-use-capability/

Soil type	The NZLRI is a spatial database containing about 100,000 polygons (map units), each of which describes a parcel of land in terms of five characteristics or attributes (rock, soil, slope, erosion, vegetation). This layer represents a FIS dissolve on the soil attribute of the NZLRI.	The 25m gridded layer is available at: http://lris.scinfo.org.nz/#/layer/66-nzlri-soil/

Set 3: Leases

(a) The mapped area substantially corresponds with the area of the pastoral lease.

(b) Changes to this table may be made subsequent to publication of these rules and can be found at www.linz.govt.nz, as per rule 3.2(b).

Table 13: Set 3 leases

LEASE	LINZ ID	Mapped Area (Ha)	Minimum Base carrying capacity	Maximum Base carrying capacity
Ahuriri Downs	12511	3,311	740	1,001
Ben Omar	34166	7,772	1,445	1,955
Blairich	12643	3,169	1,445	1,955
Branch Creek	12442	6,015	1,275	1,725
Carrickmore	12563	3,098	391	529
Cascade	12633	1,248	170	230
Cloudy Range	12791	9,296	510	690
Cora Lynn	12774	1,937	366	495
Coronet Peak	12716	21,811	2,253	3,048
Godley Peaks	12679	13,370	1,275	1,725
Grafton Hills	12560	752	106	144
Inverary	12759	3,667	765	1,035
Lower Cascade	12632	1,040	145	196
Matukituki	12591	6,086	978	1,323
Mt Hope	12564	1,033	128	173
Mt Prospect	12663	3,348	723	978
Muller Station	12640	27,785	2,576	3,485
Obelisk	12540	2,764	595	805
Patearoa Syndicate	12473	3,394	357	483
Peak Valley	34169	4,269	663	897
Rainbow (Pm025 Pn001)	12790/16863	6,481	723	978
Rugged Ridges	12476	9,651	1,080	1,461
Silver Hill	12715	1,150	221	299
Stew Point	12722	3,245	850	1,150

LEASE	LINZ ID	Mapped Area (Ha)	Minimum Base carrying capacity	Maximum Base carrying capacity
Temple Peak Station	12455	7,419	595	805
The Grampians	12682	15,990	2,053	2,777
The Homestead	12467	3,420	357	483
Waterloo Station	12650	3,712	680	920
West Hills	12719	1,098	183	247

Appendix 4: Definition of stock unit and conversion tables

(a) The following defines stock units for the purposes of these rules. Definitions may be updated subsequent to publication of these rules and can be found at www.linz.govt.nz.

(b) For the purposes of these rules, a stock unit is defined[1] as one breeding ewe that weighs 55 kg, which over a year:

(i) bears one lamb,

(ii) consumes approximately 550 kilogram's dry matter assuming average quality feed (10.8 ME and 555 kg dm),

(iii) includes the feed consumed by her lamb up to weaning, at 3.5 months, and

(iv) has an energy requirement of 6,000 kilojoules of metabolisable energy.

(c) For ewes other than that above, use the values in the table below that most closely correspond.

Sheep									
Ewe	**Percent Lambs Weaned**								
weight	**70%**	**80%**	**90%**	**100%**	**110%**	**120%**	**130%**	**140%**	**150%**
35 kg	0.65	0.70	0.75						
40 kg	0.70	0.75	0.80	0.85	0.90				
45 kg	0.75	0.80	0.85	0.90	0.95				
50 kg	0.80	0.85	0.90	0.95	1.00	1.05	1.10	1.15	
55 kg		0.90	0.95	**1.00**	1.05	1.10	1.15	1.20	1.25
60 kg			1.00	1.05	1.10	1.15	1.20	1.25	1.30
65 kg				1.10	1.15	1.20	1.25	1.30	1.35
70 kg				1.15	1.20	1.25	1.30	1.35	1.40
75 kg				1.20	1.25	1.30	1.35	1.40	1.45

(d) For types of stock other than ewes above, use the values in the table below that most closely correspond.

[1] Based on Lincoln University 2003 and 2011, *Lincoln University Farm Technical Manual*, Lincoln University, Lincoln

Stock Unit Measurements for Sheep, Cattle and Deer (including young stock)

Sheep

Ewe (see table 1.1)				
Wether				0.7
Ram				1.0
Hogget	30 kg	slow growth rate		0.7
	40 kg	medium growth rate		1.0
	50 kg	rapid growth rate (pre-winter hogget weights)		1.2

Beef Cattle

Beef Cow	350 kg	68% calves weaned		3.7
	400 kg	83% calves weaned		4.4
	450 kg	77% calves weaned		5.3
	500 kg	90% calves weaned		6.3
Beef Weaners 135 - 270 kg				3.5
Beef	200 - 400 kg	slow growing		3.7
	200 - 465 kg	rapid growing		4.6
	350 - 500 kg			4.7
Bull	500 kg			6.0
Jersey yearling 0 -12 months				1.7
Friesian yearling 0 -12 months				1.9
Jersey heifer				3.0
Friesian heifer				3.4
Heifer calf, autumn born				2.0
Rising 1 year heifer				3.5
Rising 2 year heifer, empty				4.5
Rising 2 year heifer, in-calf				6.0
Rising 3 year heifer, in-calf				6.0
Beef breeding cow				6.0
Steer or bull calf, autumn-born				2.0
Rising 1 year steer/bull				4.0
Rising 2 year steer				5.0
Rising 3 year steer, and older				5.5
Rising 2 year bull, and older				5.5
Nurse cow, multiple-suckled			up to	8.0

Deer

Red deer	Weaning to 15 months	Males		1.4
		Females		1.2
	15 to 27 months	Males		1.8
		Females		1.8
	Adults	Males		2.1
		Females		1.9
Wapiti	add 0.1 to red deer values			
Fallow deer	Weaner buck			0.6
	Yearling buck			0.7
	Yearling doe			0.6
	Mature doe			0.9

Deer

	Females Winter Weight	Stock Units	Males Winter Weight	Summer Weight (kg)	Velveting Stags Stock Units	Breeding Stags Stock Units
New Zealand Red	95 - 100	1.9 - 2.1	170	240	2.80	3.20
English / German	100 - 130	2.0 - 2.2	190	280	3.00	3.40
East European X Red	120 - 140	2.1 - 2.2	205	320	3.20	3.60
East European	130 - 150	2.2 - 2.6	215	340	3.60	4.00
New Zealand Wapiti	150 - 180	2.6 - 2.7	235	350	3.60	4.00
Elk / Wapiti	200 - 240	2.8 - 3.0	245	400 +	4.20	4.60

Deer

	Liveweight at Weaning	Autumn Growth Rate (g/d)	kg DM/day of feed	Relative Feed Requirements
Typical NZ Red	49	150	1.9	100
1/4 Wapiti 3/4 Red	57	175	2.2	119
1/2 Wapiti 1/2 Red	74	200	2.6	138
Elk / Wapiti in Canada	120	250	3.6	190

Other animals			
Goats	35 kg Doe with 130% kidding run on hill country (rough pasture)		0.5
Horses	Non-lactating horses in light work		3.0 - 7.0
	Lactating mares	up to	10

Stock unit measurement		Conversion to achieve equivalent standard stock units
	Period	
The stock unit component of the dollar-per-stock-unit rate calculated according to the method prescribed in the Crown Pastoral Land (Method for Calculating Dollar-Per Stock- Unit (Rates) Regulations and published in the gazette under s 23L(1)(a)	For leases with rent review dates 1 July 2002 to 1 July 2012	1.0
	For leases with rent review dates on or after 1 January 2013	1.0
Stock units used in calculating base carrying capacity	For leases with rent review dates on or after 1 January 2012	1.0
	For leases with rent review dates on or after 1 January 2013	1.0
Stock units current	For leases with rent review dates on or after 1 January 2012	1.0
	For leases with rent review dates on or after 1 January 2013	1.0

COMMENTARY

- Section 23O(a)(iii)C provides that the Valuer-General must make rules that specify how non-standard stock-unit measurements are to be converted to standard stock-unit measurements for the purposes of Part 1A.
- Such rules are intended to ensure that base carrying capacities and current carrying capacities are assessed and used consistently to calculate rent.
- The Valuer-General also has to define a standard stock unit taking into account relevant industry norms and practices.
- The table above provides a mechanism to specify any stock unit conversions that may be needed. As at December 2012, no substantive conversions are needed so the conversion is expressed as 1.0.
- No substantive conversions are needed as at December 2012 because the data series that generates the dollar per stock unit rates, and the rules for assessing base and current carrying capacity, all use the same, or very similar definition of a stock unit.

Examples of when, in future, a factor that produces a substantive conversion would be needed are:

Possible change	**Notes**	**Why a factor would be needed and how it would work**
The Valuer-General changes the definition of a standard stock unit because industry norms and practice have changed	The standard stock unit should be changed so assessors lessees and their advisors are all talking about the same concept	A conversion would be needed so the same stock carrying capacity would produce the same rent whether the old or new units were used
The data series that generate the dollar per stock unit rate change to use a different stock unit definition	The Valuer-General has no control over the stock unit used in such data series	A conversion would be needed so that the rate component of the formula produces the same result for the same stock carrying capacity whether the old or new units were used

Grazing chart

GRAZING CHART

Date Completed: 25/05/2012 Sample Lease

	Area (ha)	Class of Stock	Number of Stock	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	SU Rate	Number of Weeks	Total SU weeks	Annualised SU/Ha	
Unproductive	1170																			
Native - high altitude	2000	Ewes	1000													1.0	13	13000	0.13	
																			0.00	0.13
Native - mid altitude	1500	Ewes	1500													1.0	13	19500	0.25	
																		0	0.00	0.25
Native - flats & downs	0																	0	0.00	
																		0	0.00	0.00
OSTD - mid altitude	600	Ewes	3000													1.0	7	21000	0.67	
		Hoggets	1100													0.8	6	5280	0.17	
		2 Tooths	800													1.0	11	8800	0.28	1.12
OSTD - flats & downs	650	Ewes	3000													1.0	17	51000	1.51	
		Ewes & Lambs	3000													1.2	4	14400	0.43	
		2 Tooths	800													1.0	29	23200	0.69	2.62
Pasture - dryland	200	Ewes & Lambs	3000													1.2	11	39600	3.81	
		Hoggets	1100													0.8	4	3520	0.34	
		Cows	20													6.0	52	6240	0.60	
																		0	0.00	4.75
Pasture - Irrigated	30	Hoggets	2500													0.8	7	14000	8.97	
		Dairy Heifers	50													4.5	32	7200	4.62	
																		0	0.00	
																			0.00	13.59
TOTAL PASTORAL LEASE	6150																	4360	SU	0.71
Freehold/other land	100	Hoggets	1100													0.8	18	15840	3.05	
		2 Tooths Dry	800													0.8	20	12800	2.46	
		Dairy Heifers	50													4.5	13	2925	0.56	
																		0	0.00	6.07
Feed made on lease																		0	0.00	
																		0	0.00	
																		0	0.00	
																		0	0.00	0.00
Feed from off lease	1	Hoggets	1100													0.8	9	7920	152.31	
																		0	0.00	
																		0	0.00	
																		0	0.00	152.31
TOTAL SU																		5120	SU	

Appendix 5: Explanation of land use capability class and unit

Land use capability (LUC) class

(a) The LUC class is the broadest grouping of the capability classification. It is an assessment of the land's capability for use, while taking into account its physical limitations and its versatility for sustained production.

(b) There are eight classes, denoted by Arabic numerals, with limitations to use increasing, and the versatility of use decreasing, from LUC class 1 to LUC class 8.

(c) LUC units 1 to 4 are suitable for arable cropping (including vegetable cropping), horticultural (including vineyards and berry fields), pastoral grazing, tree crop or production forestry use. Classes 5 to 7 are not suitable for arable cropping but are suitable for pastoral grazing, tree crop or production forestry use, and, in some cases, vineyards and berry fields. The limitations to use reach a maximum with LUC class 8. Class 8 land is unsuitable for grazing or production forestry, and is best managed for catchment protection and/or conservation or biodiversity.

Land use capability subcategory

Each LUC unit has a subcategory of the LUC class through which the main kind of physical limitation or hazard to use is identified. Four limitations are recognised:

'e' erodibility – where susceptibility to erosion is the dominant limitation.

'w' wetness – where a high water table, slow internal drainage, and/or flooding constitutes the dominant limitation.

's' soil – where the dominant limitation is within the rooting zone. This can be due to shallow soil profiles, subsurface pans, stoniness, rock outcrops, low soil water holding capacity, low fertility (where this is difficult to correct), salinity or toxicity.

'c' climate – where the climate is the dominant limitation. This can be summer drought, excessive rainfall, unseasonal or frequent frost and/or snow, and exposure to strong winds or salt spray.

Land use capability unit

(a) The LUC Unit is the most detailed component of the LUC classification. LUC units can be subdivided into a number of LUC units. LUC units group together areas where similar land inventories have been mapped, which require the same kind of management, the same kind and intensity of conservation treatment, and are suitable for the same kind of crops, pasture or forestry species, with similar potential yields. LUC units are identified by Arabic numerals at the end of the LUC code. An example of the LUC nomenclature is '6e1', where '6' is the LUC class, '6e' is the LUC unit, and '6e1' is the LUC Units. Within LUC classifications, LUC units are arranged (within LUC units) in order of decreasing versatility for use and increasing degree of limitation to use.

(b) As an example, the following are the short descriptions for all of the 4s units for the 'South Island extended legend' which covers most of the high country.

4s 1 Shallow and stony flood plains in cool, moist districts.

4s 2 Flood plains with shallow stony soils liable to flooding.

4s 3 Flat to undulating terraces and fans with shallow stony soils and a mainly cool, moist climate.

4s 4 Flat to gently undulating terraces and outwash plains, with shallow stony, low fertility soils, in cold inland districts. Liable to wind erosion when cultivated.

4s 5 Intermediate and high terraces in high rainfall districts. Soils are shallow and stony but not podzolised.

4s 6 Flood plains, low terraces and fans with shallow, stony soils of medium fertility in seasonally moisture-deficient districts.

4s 7 Terraces and plains with shallow and stony soils of medium to low fertility in seasonally moisture-deficient districts.

4s 8 Salt lake and lagoon margins with soils of moderate to high salinity.

4s 9 Terraces and fans with shallow, stony soils in districts with cold winters and dry summers.

4s10 Flat to rolling terraces and downs in moderately high rainfall districts, with podzolised soils of very low fertility. Drainage is difficult and cropping potential marginal.

4s11 Coastal sand flats and undulating dunes in relatively sheltered or moist situations. The low fertility and low moisture-holding capacity, together with poor soil structure, are the main limitations to cropping use.

4s12 Inland flood plains, terraces and fans with shallow, stony soils and a cool, moist climate

4s13 Flat to undulating terraces with very low fertility soils in cool, moist climate.

4s14 Flat to rolling high country terraces and moraines with shallow, stony, very low fertility soils.

4s15 Flat to undulating terraces, fans and flood plains with a seasonally high concentration of soluble salts affecting plant growth.

For more information see the Land Use Capability Survey Handbook (ed. 3) published in 2009

Appendix 6: Forms for dispute resolution

Form One: Accepting or rejecting initial assessment

Land Information New Zealand
Tairō te whenua

Accepting or rejecting initial assessment

FORM ONE

Form specified by the Valuer-General under section 23D(3)(f) of the Crown Pastoral Land Act 1998

1. CROWN ASSESSORS INITIAL ASSESSMENT

Attached to this form is the Crown Assessors initial assessment of the base and/or current carrying capacity of **[lease name]**.

2. ACCEPTANCE OR REJECTION OF INITIAL ASSESSMENT

You must respond in writing to the Commissioner of Crown Lands through **[name of portfolio manager]** at LINZ, CBRE House, 112 Tuam Street, Private Bag 4721, Christchurch 8140 by **[DATE – 7 days plus 15 working days of posting]** either:

a. accepting the initial assessment, or

b. rejecting the initial assessment

3. PROCESS FOR ACCEPTANCE OR REJECTION OF INITIAL ASSESSMENT

Attached is a form for:

a. accepting the initial assessment, or

b. rejecting the initial assessment

If you accept the initial assessment, the carrying capacity in the initial assessment will be used to calculate your rent.

If you reject the initial assessment, you must appoint an assessor and the carrying capacity which will be used to calculate your rent will be fixed through the dispute resolution procedure shown in Appendix One of this form.

If you do not respond within the specified timeframes, the carrying capacity in the initial assessment will be used to calculate your rent and you will not be able to use the dispute resolution procedure.

NOTE: In accordance with the Crown Pastoral Land Act 1998, the timeframes for all stages of the dispute resolution process are tightly specified and both parties need to be clear on the critical dates.

The process and timeframes for dispute resolution are shown in Appendix One of this form.

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4. ASSESSORS AND EXPERT DETERMINERS

Only individuals designated by the Valuer-General can act as assessors.

- Table One displays individuals that have been designated at the date of the initial assessment
- The most recent list of designated assessors and expert determiners is available on the LINZ website at www.linz.govt.nz
- Subject to rule 5 of the *Rules for Assessment of Carrying Capacity of Crown Pastoral Land (Rents for Pastoral Leases)*, you can act as your own assessor, provided you are designated as an assessor by the Valuer-General. See www.linz.govt.nz for details.
- You will need to become designated as an assessor by the time the expert determiner is appointed.

Only individuals designated by the Valuer-General can act as expert determiners.

- Table Two displays individuals that have been designated as expert determiners at the date of the initial assessment.

Table One

Valuer-General designated assessors	Status	Designation Type

Table Two

Valuer-General designated expert determiners

Acceptance or rejection of initial assessment

Under section 23D (4) of the Crown Pastoral Land Act 1998 I **[LESSEE]**:

	Tick one
Accept the Crown assessors initial assessment attached to this form	☐
Reject the Crown assessors initial assessment attached to this form	☐

I acknowledge that by accepting the initial assessment the carrying capacity within the initial assessment will be used to calculate my rent and I will not be able to use the dispute resolution procedure.

I acknowledge that by rejecting the initial assessment I must appoint an assessor to act on my behalf or, if applicable, I will act for myself.

Signed _____

Lessee _____

Date _____

Please ensure that all lessees sign if there is more than one lessee.

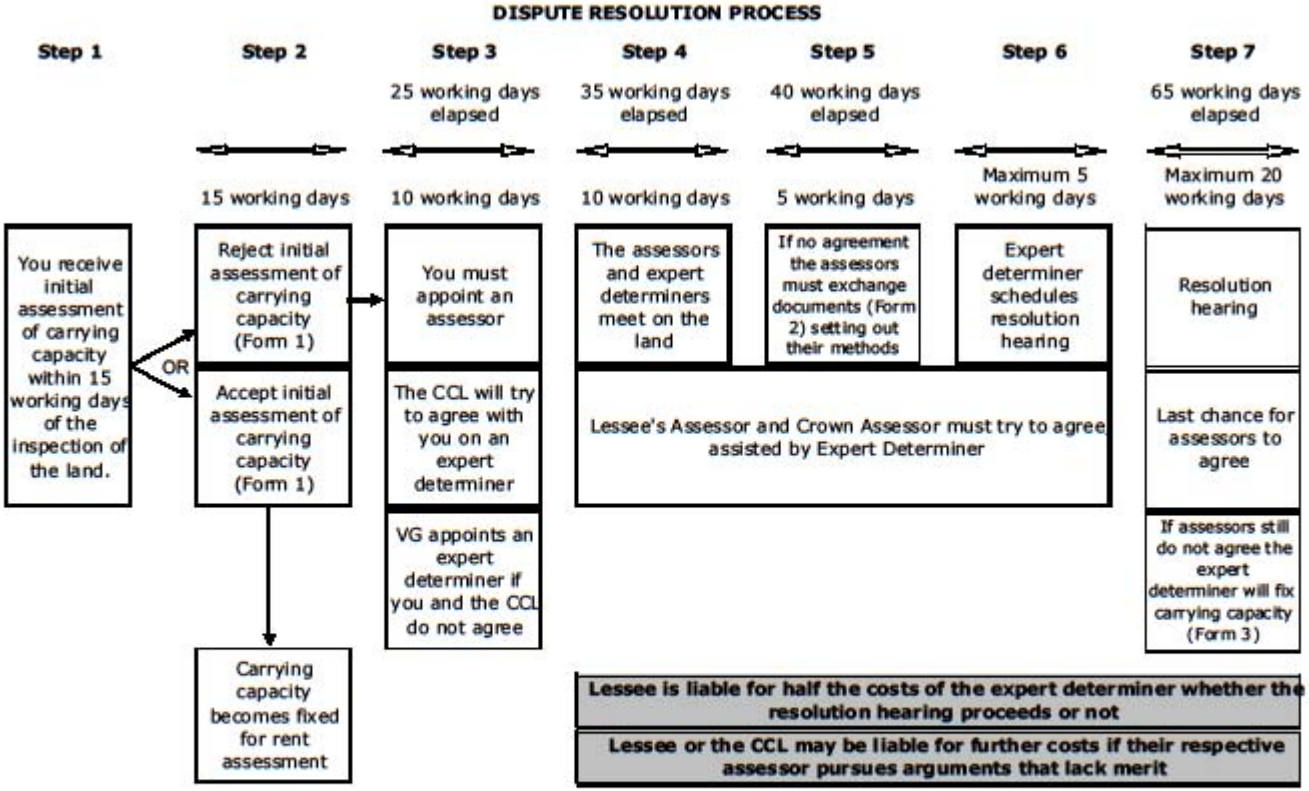
If the lessee(s) is unable to sign personally:

1. in the case of an individual, provide evidence of a valid power of attorney granted by the lessee, or a person or party constituting the lessee, appointing another person as his or her attorney, or

2. in the case of a company, provide evidence of a director's resolution of the company delegating responsibility for signing on behalf of the company in accordance with the company's constitution, or

3. in the case of a trust, provide evidence of a valid deed of delegation, authorised under the trust deed, empowering another person to sign on behalf of the trust as attorney, and accompanied by a certificate of non-revocation.

APPENDIX ONE – DISPUTE RESOLUTION PROCESS



CCL – Commissioner of Crown Lands

Form Two(a):

Explanation of assessor's assessment for current carrying capacity

Land Information New Zealand
Toitū te whenua

Assessor's assessment for disputes about current carrying capacity

Explanation of assessor's assessment provided by the 5th working day after meeting on the land

FORM TWO

Form specified by the Valuer-General under section 23G(4) of the Crown Pastoral Land Act 1998

This form is to be completed by an assessor.

The following information has been provided:

1. The Crown assessor's initial assessment
2. The lessee's assessor's assessment under s 23(G)(1)(d) of the Act
3. Any other information not in (1) or (2) that is material and gained at the meeting on the land
4. Explanation of the relevance of each element of the above information
   Provide details:
5. Authority, rules, or regulations that permit or require the use of each element
   Provide details:
6. Steps in the process for assessing current carrying capacity

The following rule requirements have been completed	Briefly describe means of compliance	Is there disagreement of a material nature? If so describe nature of disagreement.
Rule 4.2.2(a)-(c) Boundaries of the pastoral lease Determination of area variation Estimation and determination of area discrepancy threshold		
Rule 4.2.2(d) Calculation of current carrying capacity		

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7. Append full report of assessor's assessment of current carrying capacity in accordance with best practice in valuation and farm management advisory, and

The following rule requirements have been completed	Note relevant parts of the assessment that comply	Is there disagreement of a material nature? If so describe nature of disagreement.
Indicate parts of the assessment that gives effect to Rule 4.2.5(a)(i)-(iii), Average efficient carrying capacity		
Rule 4.2.5(b) Best practice in valuation and farm management advisory		

The following have been considered in the assessment Rule 4.2.5(c)(i)–(xii)	Briefly describe means of compliance or note relevant parts of the assessment	Is there disagreement of a material nature? If so describe nature of disagreement.
Assumption that the land has been farmed sustainably at average efficient levels		
Types, class and numbers of stock carried in each of the last five years and the reasons for any significant variations		
Production and performance of stock carried in each of the last five years and the reasons for any significant variations		
How parts of the pastoral lease are grazed over each year		
The specific effects of weeds and pests		
Current level of land development		
Current level of structural development		
Areas of the property that are unable to be stocked		
Areas of the property where stocking is restricted due to arrangements that would bind a bona fide purchaser of the lease and have been explicitly consented to by the Commissioner		
Constraints on stocking created by obligations under the lease or statutes affecting the lease and assumptions made on these constraints		

The following have been considered in the assessment Rule 4.2.5(c)(i)–(xii)	Briefly describe means of compliance or note relevant parts of the assessment	Is there disagreement of a material nature? If so describe nature of disagreement.
Constraints on stocking created by controls under the Resource Management Act 1991 and assumptions made on these constraints		

Signed _____

Crown's assessor
or lessee's assessor _____

Date _____

To: [Name of lessee]

And to: Commissioner of Crown Lands

Form Two(b):

Explanation of assessor's assessment for pastoral leases in Set 1

Assessor's assessment for disputes about base carrying capacity for pastoral leases in Set 1

Explanation of assessor's assessment provided by the 5th working day after meeting on the land

FORM TWO

Form specified by the Valuer-General under section 23G (4) of the Crown Pastoral Land Act 1998

This form is to be completed by an assessor.

The following information has been provided:

1. The Crown assessor's initial assessment
2. The lessee's assessor's assessment under s 23(G)(1)(d) of the Act
3. Any other information not in (1) or (2) that is material and gained at the meeting on the land
4. Explanation of the relevance of each element of the above information
   Provide details:
5. Authority, rules, or regulations that permit or require the use of each element
   Provide details:

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6. Steps in the process assessing base carrying capacity

The following rule requirements have been completed	Briefly describe means of compliance	Is there disagreement of a material nature? If so describe nature of disagreement.
Rule 1.4.2(a)–(c) Boundaries of the pastoral lease Determination of area variation Estimation and determination of area discrepancy threshold		
Rule 1.4.2(d) Estimation and determination of isolation/access threshold		
Rule 1.4.2(e) Calculation of base carrying capacity		

Signed _____

Crown's assessor
or lessee's assessor _____

Date _____

To: [Name of lessee]

And to: Commissioner of Crown Lands

Form Two(c):

Explanation of assessor's assessment for pastoral leases in Set 2

Assessor's assessment for disputes about base carrying capacity for pastoral leases in Set 2

Explanation of assessor's assessment provided by the 5th working day after meeting on the land

FORM TWO

Form specified by the Valuer-General under section 23G (4) of the Crown Pastoral Land Act 1998

This form is to be completed by an assessor.

The following information is provided:

1. The Crown assessor's initial assessment
2. The lessee's assessor's assessment under s 23(G)(1)(d) of the Act
3. Any other information not in (1) or (2) that is material and gained at the meeting on the land
4. Explanation of the relevance of each element of the above information
   Provide details:
5. Authority, rules, or regulations that permit or require the use of each element
   Provide details:

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6. Steps in the process assessing base carrying capacity

The following rule requirements have been completed	Briefly describe means of compliance	Is there disagreement of a material nature? If so describe nature of disagreement.
Rule 2.4.2(a)–(c) Boundaries of the pastoral lease Determination of area variation Estimation and determination of area discrepancy threshold		
Rule 2.4.2(d) Estimation and determination of isolation/access threshold		
Rule 2.4.2(e) Calculation of base carrying capacity		

Signed _____

Crown's assessor
or lessee's assessor _____

Date _____

To: [Name of lessee]

And to: Commissioner of Crown Lands

Form Two(d):

Explanation of assessor's assessment for pastoral leases in Set 3

Assessor's assessment for disputes about base carrying capacity for pastoral leases in Set 3

Explanation of assessor's assessment provided by the 5th working day after meeting on the land

FORM TWO

Form specified by the Valuer-General under section 23D(G)(4) of the Crown Pastoral Land Act 1998

This form is to be completed by an assessor.

The following information has been provided:

1. The Crown assessor's initial assessment
2. The lessee's assessor's assessment under s 23(G)(1)(d)
3. Any other information not in (1) or (2) that is material and gained at the meeting on the land
4. Explanation of the relevance of each element of the above information
   Provide details:
5. Authority, rules, or regulations that permit or require the use of each element
   Provide details:

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6. Steps in the process assessing base carrying capacity

The following rule requirements have been completed	Briefly describe means of compliance	Is there disagreement of a material nature? If so describe nature of disagreement.
Rule 3.5.2(a)–(c) Boundaries of the pastoral lease Determination of area variation Estimation and determination of area discrepancy threshold		
Rules 3.5.2(d) Construction of a notional state for the land and assumptions made about stock in the notional state		
Rule 3.5.2(e) Calculation of base carrying capacity		

Signed _____

Crown's assessor
or lessee's assessor _____

Date _____

To: [Name of lessee]

And to: Commissioner of Crown Lands

Form Three: Notice of determination by expert determiner

Land Information New Zealand
Toitū te whenua

Notice of Determination by Expert Determiner of Base Carrying Capacity and/or Current Carrying Capacity of [Lease Name and LINZ ID]

FORM THREE

Form specified by the Valuer-General under section 23H(2) of the Crown Pastoral Land Act 1998

This form is to be completed by the expert determiner.

The Lease	
Meetings and/or hearing details	
Crown assessor's initial assessment	
Lessee's assessor's initial assessment	
Explanations	
The issues	
Examination of the issues	
Authority or rules or regulations that apply to the issues	
Resolution of the issues	
Determination of base carrying capacity and/or current carrying capacity	
Award of costs	

Signed _____

Expert determiner _____

Date: _____

To: [Name of lessee]

And to: Commissioner of Crown Lands

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Appendix One – Award of costs

Under s 23H(5) of the Crown Pastoral Land Act 1998 (Act) the expert determiner may make an award of costs.

In making an award of costs the expert determiner must provide that:

1) the lessee pay the fees for the lessee's assessor and pay for any expenses incurred by the lessee's assessor that are associated with complying with the requirements of Part 1A of the Act,
2) the Commissioner of Crown Lands (Commissioner) pay the fees for the Crown assessor and pay for any expenses incurred by the Crown assessor that are associated with complying with the requirements of Part 1A of the Act, and
3) the lessee and the Commissioner pay an equal share of the fees of the expert determiner and pay for any expenses that are associated with holding the resolution hearing (whether the hearing proceeds or not).

However, despite the above, the expert determiner may require the lessee to pay a portion of the fees and expenses that the Commissioner would otherwise pay, or require the Commissioner to pay a portion of the fees and expenses that the lessee would otherwise pay, if the lessee's assessor or a Crown assessor (as the case may be) has, unreasonably or without justification:

1) contributed to the time or expense involved in complying with the requirements of Part 1A of the Act, or
2) failed to comply, by act or omission, with Part 1A or any regulations or rules under Part 1A of the Act, or
3) taken a position or pursued an argument that lacks merit, including (but not limited to) refusing to accept facts that should have been accepted.

Appendix Two – appeals on questions of law

If the Commissioner or a lessee of a pastoral lease is dissatisfied with any determination by an expert determiner of base carrying capacity and/or current carrying capacity as being erroneous in point of law, the Commissioner or lessee may appeal to the High Court on that question of law.

Any such appeal must be dealt with in accordance with the Rules of Court.

On any appeal, the High Court must hear and determine the question of law arising in the proceedings, and must do one or more of the following:

1) confirm or amend the determination in respect of which the appeal has been brought; or
2) quash the determination and remit the matter to the expert determiner along with a copy of the decision of the High Court; or
3) make any other order in relation to the matter that the High Court thinks fit.

Currently the time prescribed for appeals to the High Court on a point of law is **[number]** days.