Haram Kraft

Støyberegninger

Støyberegninger

Oppdragsnr.: **5195963** Dokumentnr.: **KVT/MEH/2020/N020 Rev1** Versjon: **J02** Dato: **2020-05-19**

Norconsult

Støyberegninger

Sammendrag/konklusjon

Støynivåene generert av vindturbinene planlagt for Haramsfjellet vindpark er beregnet for to ulike alternative turbinplasseringer; fra mai 2019 (MTA) og fra april 2020. Begge alternativene består av 8 Vestas V136-4.2 MW turbiner. De 8 turbinene er planlagt å ha en navhøyde på 82 m og en totalhøyde på 150 m. Det er brukt 3 ulike driftsmodus i beregningene hvor modus PO1 er optimalisert for effekt, og modus SO1 og SO2 er støyreduserende. For modus PO1 er effekten til hver av turbinene 4.2 MW, mens når turbinene kjøres i støyreduserende modus er effekten 4.0 MW. Kildestøyen til modus PO1 er 103.9 dB(A), for SO1 er den 102.0 dB(A), og for SO2 er den 99.5 dB(A).

Beregningene er utført ved bruk av NORD2000 modellen for spredning av støy hvor det er tatt inn høydekoter, terrengruhet og terrengtype for å beskrive området rundt Haramsfjellet vindpark. Dermed er støynivåene beregnet og viser at ved bruk av PO1 modus på alle turbiner er det 1 bolig og 2 planlagte hytter som overskriver L_{DEN} 45 dB(A) grensen for begge alternative turbinplasseringer. Ved bruk av støyreduserende modus på utvalgte turbiner på alternativet fra april 2020 kommer alle byggene under L_{DEN} 45 dB(A) grensen, altså utenfor gul støysone.

J02	2020-05-19	Støyberegninger på Haramsfjellet. Sammenligning med MTA.	Maria Enger Hoem	Lars Tallhaug	Finn Nyhammer
J01	2020-05-15	Støyberegninger på Haramsfjellet.	Maria Enger Hoem	Lars Tallhaug	Finn Nyhammer
Versjon	**Dato**	**Beskrivelse**	**Utarbeidet**	**Fagkontrollert**	**Godkjent**

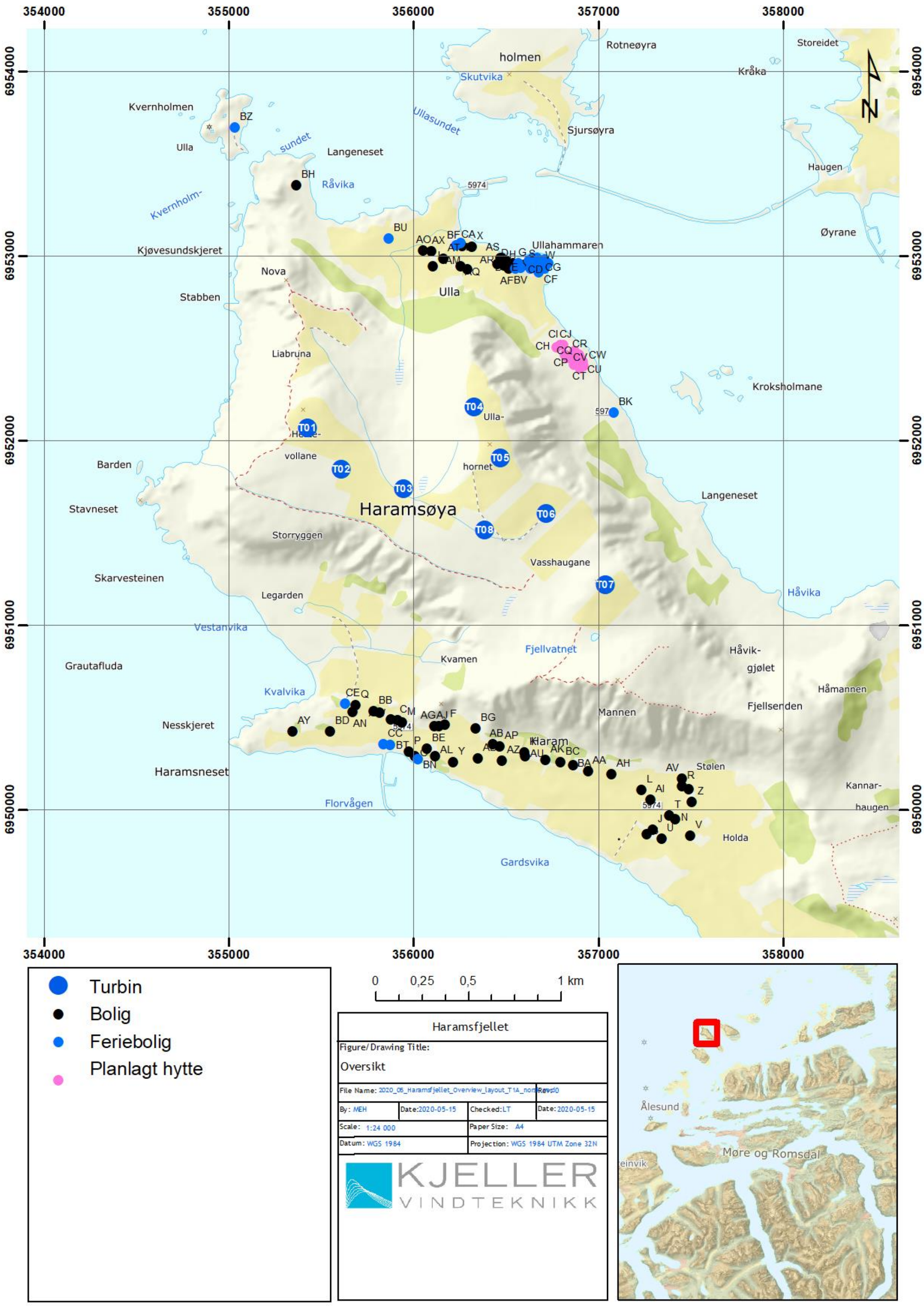
1 Endring i turbinplassering

Turbinenes plassering er endret etter mai 2019 (MTA), hvor turbin T01, T02, T03, T04, T05 og T08 har endret plassering. Turbin T01 har størst endring i posisjon i forhold til tidligere. Endringene i posisjon for hver av turbinene fra mai 2019 til april 2020 er vist i Tabell 1-1.

Tabell 1-1: Turbinposisjoner fra MTA fra mai 2019 og for april 2020 med endring i plassering gitt for hver turbin.

	MTA		April 2020		Endring (m)	
WTG	Øst	Nord	Øst	Nord	Øst	Nord
T01	355408	6952169	355427	6952069	19	-100
T02	355452	6951811	355607	6951847	155	36
T03	355787	6951697	355946	6951739	159	42
T04	356322	6952279	356327	6952184	5	-95
T05	356463	6951917	356469	6951907	6	-10
T06	356717	6951604	356717	6951604	0	0
T07	357038	6951221	357038	6951221	0	0
T08	356315	6951556	356383	6951518	68	-38

Oversikt over turbinplasseringene fra april 2020 samt omkringliggende bygg er vist i Tabell 1-1. Turbinene som er flyttet lengst, T01, T02 og T03 er de turbinene som ligger lengst unna bebyggelsen og påvirker støynivåene på de mest utsatte områdene nordøst for parken minimalt. I kapittel 6 er endring i avstand mellom støymottaker og hver av turbinene etter at plasseringen av turbinene er endret fra mai 2019 til april 2020 vist.



Figur 1-1: Oversikt over Haramsfjellet vindpark. Turbinplassering fra april 2020.

2 Støyberegninger

2.1 Metode

Støyberegningene er utført ved bruk av NORD2000 modulen i WindPRO 3.3.274 (EMD, 2019). Dette er en avansert metode originalt utviklet for veitrafikkstøy, men som i senere år har blitt brukt også for vindturbinstøy. Modellen tar hensyn til topografi, terrengoverflatens egenskaper, lydens frekvenssammensetning og meteorologiske parametere.

Ifølge gjeldende retningslinje for behandling av støy i arealplanlegging, T-1442/2016 definert av Klima- og miljødepartementet, skal alle beregninger av støy fra vindturbiner utføres med en vindhastighet på 8 m/s i 10 m høyde (Miljødirektoratet, 2018) (Klima- og Miljødepartementet, 2016). Grunnen til dette er at støynivået fra turbinene normalt oppfattes som sterkest ved denne hastigheten. Ved høyere hastigheter er ofte bakgrunnsstøyen høyere enn støyen fra turbinene og vil dermed dominere støybildet. Dersom andre vindhastigheter fører til mer støy enn 8 m/s i 10 m høyde skal dette tas med i beregningene.

Retningslinjen T-1442 definerer to ulike soner for støynivå:

- **Rød sone.** Sonen nærmest støykilden. Sonen angir et område som ikke er egnet til støyfølsomme bruksformål. Ifølge retningslinjene i T-1442/2016 (Klima- og Miljødepartementet, 2016) er grensen for rød sone L_{DEN} på 55 dB(A).

- **Gul sone.** Sonen ligger lengre vekk fra støykilden enn rød sone. Dette er en vurderingssone i forhold til aktivitet, og kan godtas dersom avbøtende tiltak gir tilfredsstillende forhold. Ifølge T-1442/2016 (Klima- og Miljødepartementet, 2016) er grensen for gul sone L_{DEN} på 45 dB(A).

Støyparameteren L_{DEN} er definert som beregnet årsmidlet støynivå med ulik vekting for dag, kveld og natt (Day-Evening-Night). Tid om kvelden (19-23) gir et 5 dB(A) tillegg, mens om natten (23-07) er det et 10 dB(A) tillegg. Når man beregner seg fra uvektet midlet nivå til L_{DEN} vil det gi en økning på 6,4 dB(A) på verdiene forutsatt at støyenkilden er den samme gjennom døgnet.

Beskrivelsen av metoden over samsvarer med metoden til «Worst case»-beregningene som er dem det legges hovedvekt på ved avgjørelser angående støy rundt vindturbiner (Miljødirektoratet, 2018).

2.2 Metode, støyredusert alternativ

Et alternativ til å kjøre alle turbinene i PO1 (Power Optimized) modus som gir høyest effekt, men også mest støy, kan turbinene kjøres i ulike støyreduserende modus som SO1 og SO2 (Sound Optimized). De ulike modusene er beskrevet senere i notatet. Dermed har turbinene lavere kildestøy og støynivåene i området rundt vindparken blir lavere.

Alternativet som er vurdert her er at turbin T04 og T06 kjøres i modus SO1, turbin T05 kjøres i modus SO2, mens resten av turbinene kjøres i modus PO1. Beregningene for det alternative caset er ellers likt til beregningene hvor alle turbinene kjøres i modus PO1, og følger retningslinjene for «worst case» beregninger.

Turbiner vil generelt gi høyest støynivåer for støymottakere som ligger nedstrøms, og støyen ved støymottakeren vil generelt være høyere jo nærmere støymottakeren er turbinen. Dersom støymottakere havner i gul sone ved bruk av kun PO1 modus kan man finne de vindretningene hvor disse støymottakerne er nedstrøms av turbinene som fører til for høye støynivåer. Her kalles disse vindretningene for de kritiske vindretningene for det alternative caset, og er her mellom 215° og 240°. Se Figur 2-1.

Figur 2-1: Skisse av det alternative caset. For de kritiske vindretningene (gul trekant og gule piler) kjøres turbin T04 og T06 i modus SO1 (røde turbiner) og turbin T05 i modus SO2 (lyseblå turbin). Resterende turbiner kjøres i modus PO1 (mørkeblå). Det er turbinplasseringer fra april 2020 som er vist.

2.3 Inngangsdata

Støyberegningene er utført på de to forskjellige turbinplasseringene presentert i kapittel 1 med 8 turbiner av typen Vestas V136 4.2 MW. Når turbinene kjører i støyreduserende modus, har de en maksimal effekt på 4.0 MW istedenfor 4.2 MW. Hovedegenskapene ved begge de to alternativene er gjengitt i Tabell 2-1.

Tabell 2-1: Felles hovedegenskaper for alternativene fra mai 2019 og fra april 2020.

Ant. WTG	Turbintype	Nominell effekt	Rotordiameter	Navhøyde	Bladhøyde
8	V136	4.2 MW (PO1*) 4.0 MW (SO1*, SO2*)	136 m	82 m	150 m

* Driftsmodusene er tilpasset drift ved høye vindhastigheter (High Wind Operation, HWO).

Oktavdataene, støydataene, er gitt av turbinleverandøren (Vestas Wind Systems A/S, 2018), og er gitt for PO1, SO1 og SO2. Maksimal kildestøy for de ulike modusene er gitt i Tabell 2-2.

Tabell 2-2: Støydata for modus PO1, SO1 og SO2. Maksimal kildestøy og tilhørende vindhastighet i navhøyde og estimert vindhastighet i 10 m høyde er også gitt.

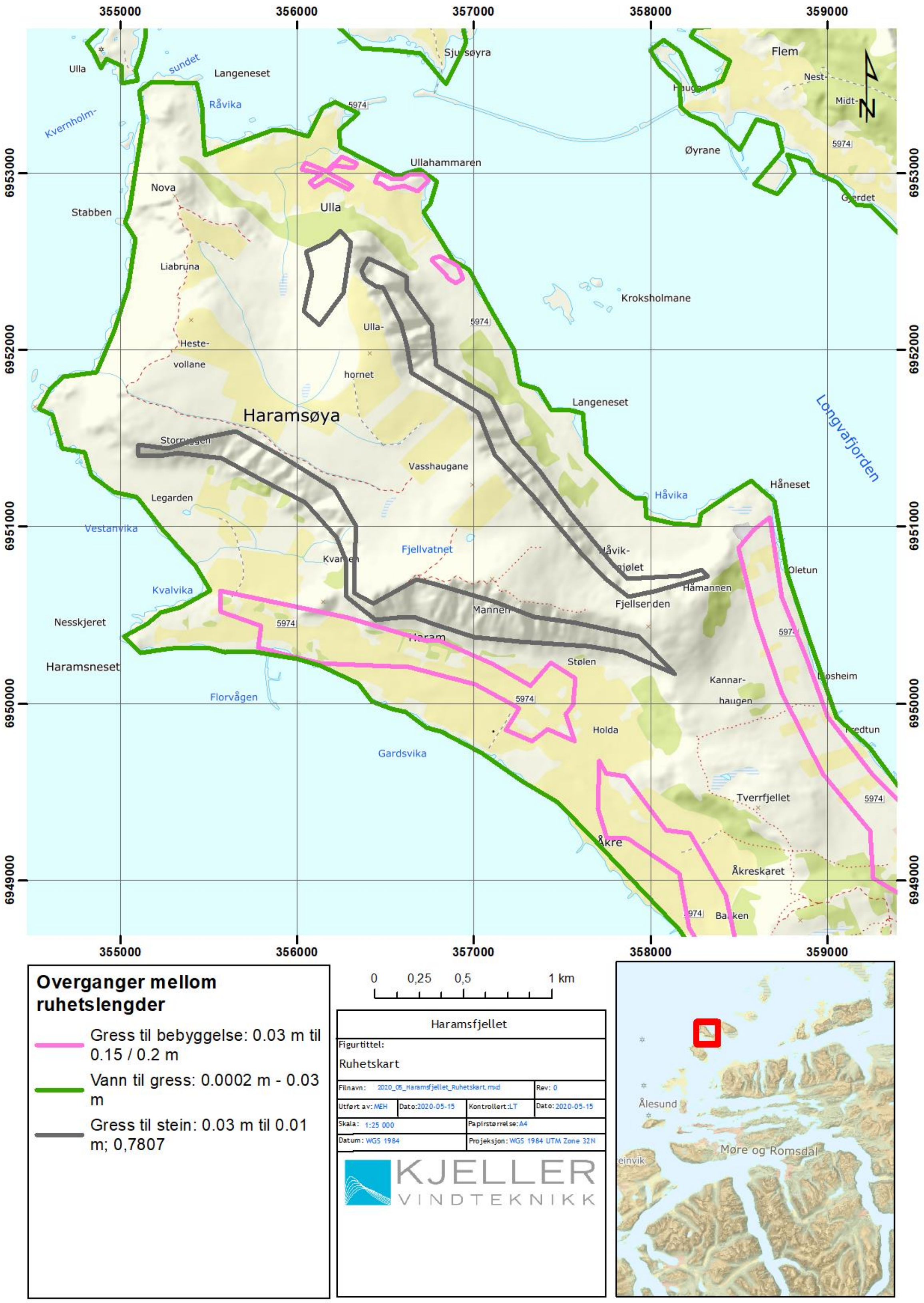
Modus	Kildestøy, L_{DEN} [dB(A)]	Vindhastighet i navhøyde [m/s]	Vindhastighet i 10 m høyde [m/s]
PO1	103.9	9	7
SO1	102.0	11	8
SO2	99.5	10	7

Beregningene på støy er gjort for alle turbinene samtidig slik at det er den totale turbinstøyen som er beregnet. Alle støymottakere er også antatt å ligge i ly for vinden i beregningene, som er standard praksis siden 2012, som gjør beregningene noe mer konservative enn om mottakerne ikke lå i ly for vinden og dermed kunne hatt høyere bakgrunnsstøy fra vinden.

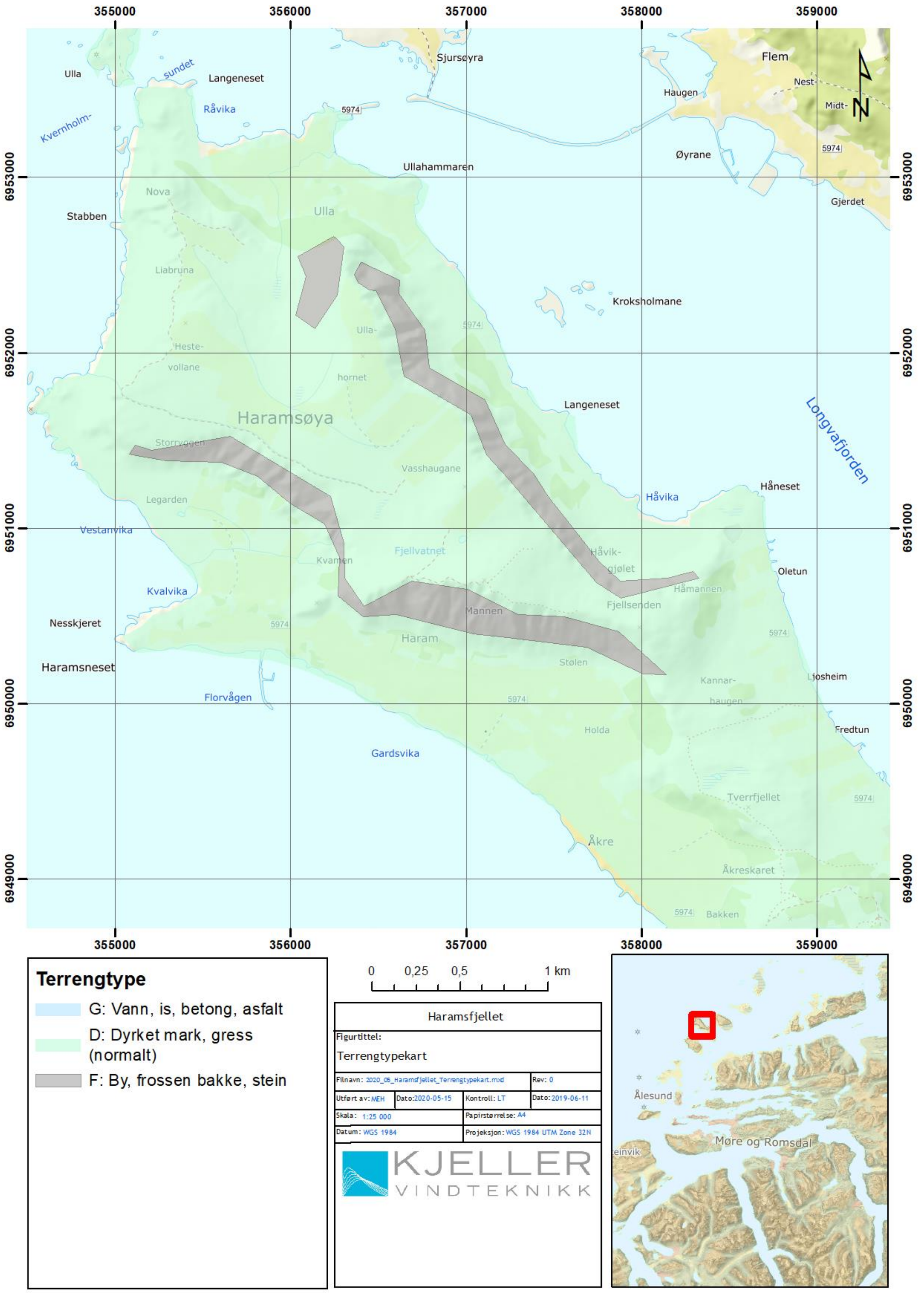
I beregningene er det inkludert ruhetskart og terrengtypekart i tillegg til høydekoter for å beskrive terrenget og overflaten i området rundt Haramsfjellet. Ruheten til terrenget justerer vindprofilet over terrenget og vil ha indirekte påvirkning på spredningen av støy ved at vinden bøyer lydbølgene. Ruheten til terrenget rundt Haramsfjellet er hovedsakelig satt til verdier tilsvarende åpent terreng med gress og lite hindringer, mens områder med mer bar stein, områder med mer bebyggelse og områder med mindre bebyggelse har fått egne representative ruheter. Vannet rundt øyen har også fått egen ruhet. Se ruhetskartet i Figur 2-2.

For støyberegningene har terrengtype større innvirkning på resultatene enn ruheten til terrenget, og da særlig i områdene nærme støymottakerne, mellom turbinene og støymottageren. Området rundt Haramsfjellet er antatt å være hovedsakelig dekket av gress, basert på satellittbilder, både i områdene nær turbinene og nær støymottakerne/husene. Fjellsidene har områder med delvis bar stein, og er områder som hovedsakelig ligger i lesoner og vil derfor ha minimal påvirkning på beregningene av støynivåene ved husene. Det er likevel lagt inn i terrengtypekartet i Figur 2-3. Både ruhetskartet og terrengtypekartet er basert på konservative valg og er gjeldene gjennom hele året i beregningene.

Støymottakerene som er inkludert i beregningene representerer boliger, ferieboliger og to planlagte hyttefelt. Koordinater er gitt av kunden og gjengitt i Vedlegg A og Vedlegg B.



Figur 2-2: Ruhetskart over Haramsfjellet vindpark. Ruhetslengder er basert på en studie av (Silva, Ribeiro, Guendes, Rua, & Ulrich, 2007).



Figur 2-3: Terrengtypekart for området rundt Haramsfjellet vindpark.

2.4 Resultater

I dette notatet er det presentert resultater for 3 forskjellige case; turbinplassering fra mai 2019 med alle turbiner i full produksjonsmodus (PO1), turbinplassering fra april 2020 med alle turbiner i full produksjonsmodus, og det alternative caset med turbinplassering fra april 2020 med noen turbiner i støyredusert modus.

- Full produksjon:
  Turbinplassering fra mai 2019 og alle turbiner i full produksjonsmodus
- Full produksjon:
  Turbinplassering fra april 2020 og alle turbiner i full produksjonsmodus
- Støyredusert alternativ:
  Turbinplassering fra april 2020 med 3 turbiner i støyredusert modus

Støykart for området rundt Haramsfjellet vindpark er vist for turbinplassering fra april 2020 i Figur 2-4 med bruk av PO1 modus, og i Figur 2-5 ved bruk av ulike modus på turbinene. Ved å følge avrundingsreglene gitt i Miljødirektoratets veileder (Miljødirektoratet, 2018), gjengitt under, er det 1 bolig og 2 planlagte hytter som overskrider L_{DEN} 45 dB(A) grensen ved bruk av PO1 modus på alle turbiner for turbinplassering fra april 2020, mens det er1 bolig og 13 planlagte hytter som ligger i gul støysone for turbinplassering fra mai 2019 (MTA). Det alternative caset med ulike modus på ulike turbiner med turbinplassering fra april 2020 gir ingen eksisterende eller planlagte hus over L_{DEN} 45 dB(A) grensen. Se samlede resultater i Tabell 2-3.

Avrundingsregel (Miljødirektoratet, 2018):

Avrundingen blir gjort på første siffer rett etter kommaet. Dersom sifferet er 0, 1, 2, 3 eller 4 rundes det ned, mens dersom sifferet er 5, 6, 7, 8 eller 9 rundes det opp.

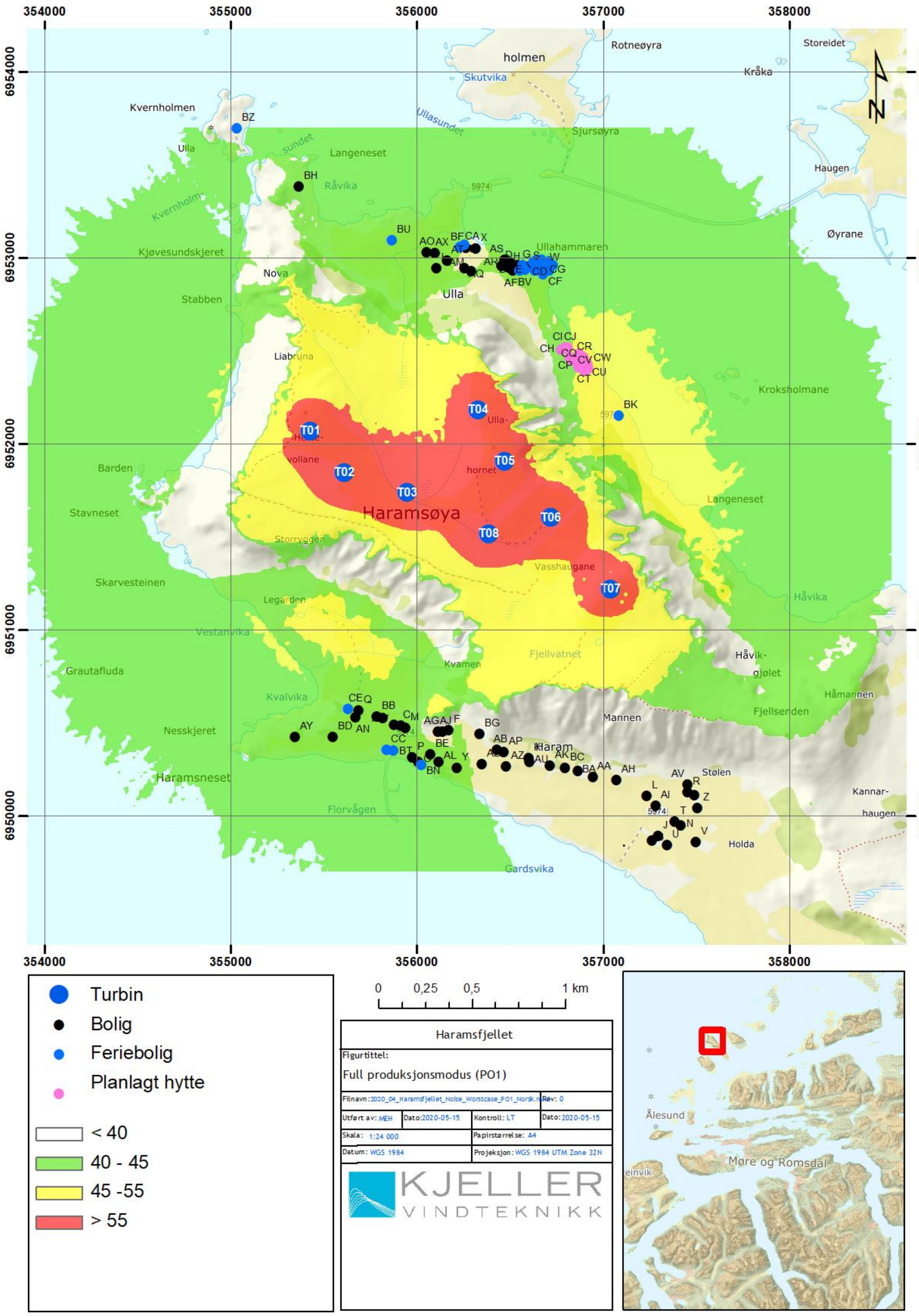
Eksempel: 54,499 = 54
54,511 = 55

Tabell 2-3: Beregnede L_{DEN} dB(A) støynivå ved eksisterende boliger og ferieboliger rundt Haramsfjellet vindpark. Resultater ved bruk av PO1 modus for begge alternativene for turbinplassering; fra mai 2019 og april 2020, og resultater for det alternative caset med turbinplassering fra april 2020.

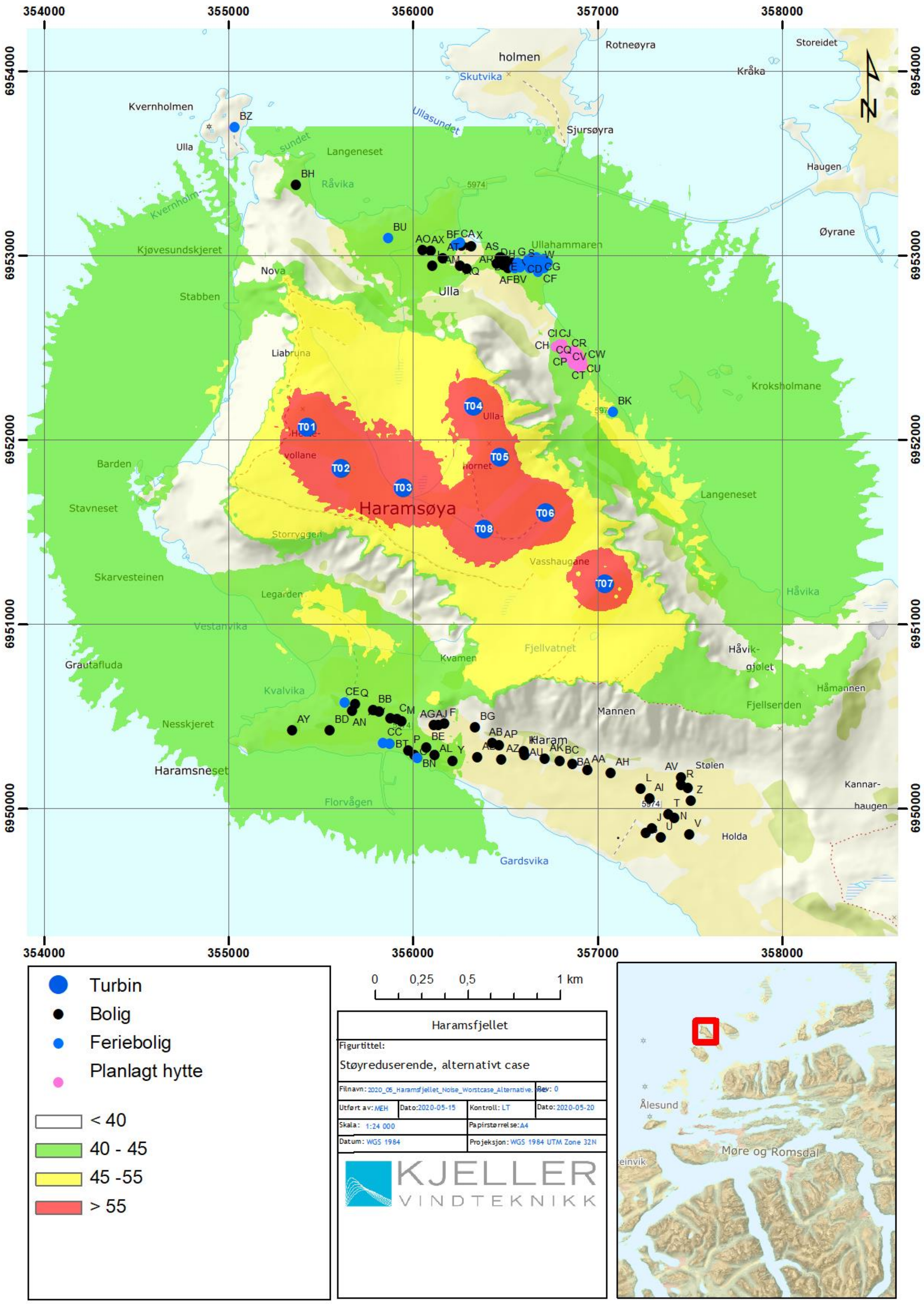
Eksisterende boliger og ferieboliger							
Turbinplassering	**Mai 2019 (MTA)**	**April 2020 (T1A)**			**Mai 2019 (MTA)**	**April 2020 (T1A)**	
Alternativ	Full produksjon	Full produksjon	Støyredusert		Full produksjon	Full produksjon	Støyredusert
A	19	19	18	AR	44	43	42
B	29	27	26	AS	44	43	42
C	44	44	44	AT	44	42	41
D	44	43	42	AU	22	22	21
E	44	43	41	AV	19	19	18
F	35	35	34	AW	44	44	44
G	44	43	42	AX	44	44	43
H	44	44	42	AY	42	42	41
I	45	43	42	AZ	37	34	34
J	29	24	22	BA	20	22	21
K	21	22	21	BB	44	44	43
L	20	20	19	BC	21	21	20
M	44	44	44	BD	43	43	43
N	22	22	21	BE	43	43	42
O	43	43	42	BF	43	40	40
P	43	43	42	BG	37	37	36
Q	44	44	43	BH	42	41	42
R	19	20	20	BI	43	41	40
S	44	44	42	BJ	44	44	42
T	22	21	20	BK	47	47	45
U	29	28	25	BL	44	44	42
V	29	27	24	BM	45	44	43
W	45	44	42	BN	43	43	42
X	44	39	41	BO	44	44	42
Y	41	41	40	BP	44	44	42
Z	19	19	19	BQ	45	44	42
AA	21	21	21	BR	44	43	42
AB	34	32	29	BS	44	44	43
AC	44	44	44	BT	43	44	43
AD	37	38	38	BU	44	44	43
AE	44	44	42	BV	45	44	42
AF	44	43	42	BW	45	44	43
AG	24	25	24	BX	44	44	42
AH	21	21	20	BY	45	44	42
AI	20	20	20	BZ	40	40	39
AJ	24	27	27	CA	43	41	40
AK	22	22	21	CB	44	44	41
AL	42	42	42	CC	44	43	43
AM	41	39	41	CD	44	45	43
AN	44	44	43	CE	44	44	44
AO	44	43	43	CF	45	44	42
AP	32	28	25	CG	45	44	43
AQ	41	39	40				

Tabell 2-4: Beregnede L_{DEN} dB(A) støynivå ved planlagte hytter rundt Haramsfjellet vindpark. Resultater ved bruk av PO1 modus for begge alternativene for turbinplassering; fra mai 2019 og april 2020, og resultater for det alternative caset med turbinplassering fra april 2020.

Planlagte hytter							
Turbinplassering	**Mai 2019 (MTA)**	**April 2020 (T1A)**			**Mai 2019 (MTA)**	**Apr. 2020 (T1A)**	
Alternativ	Full produksjon	Full produksjon	Støyredusert		Full produksjon	Full produksjon	Støyredusert
CH	43	43	42	CP	48	45	42
CI	42	42	41	CQ	47	45	43
CJ	42	44	42	CR	47	46	43
CK	46	43	41	CS	46	45	42
CL	47	44	42	CT	48	45	43
CM	47	45	42	CU	47	45	43
CN	47	45	43	CV	48	45	43
CO	47	46	44	CW	47	45	43



Figur 2-4: Støykart for Haramsfjellet vindpark med turbinplassering fra april 2020 med modus PO1 for alle turbiner.



Figur 2-5: Støykart for det alternative caset på Haramsfjellet vindpark med turbinplassering fra april 2020.

3 Referanser

EMD. (2019). *windPRO 3.3 User Manual; http://help.emd.dk/knowledgebase/*. EMD International AS.

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4 Vedlegg A: Koordinater på eksisterende boliger og ferieboliger

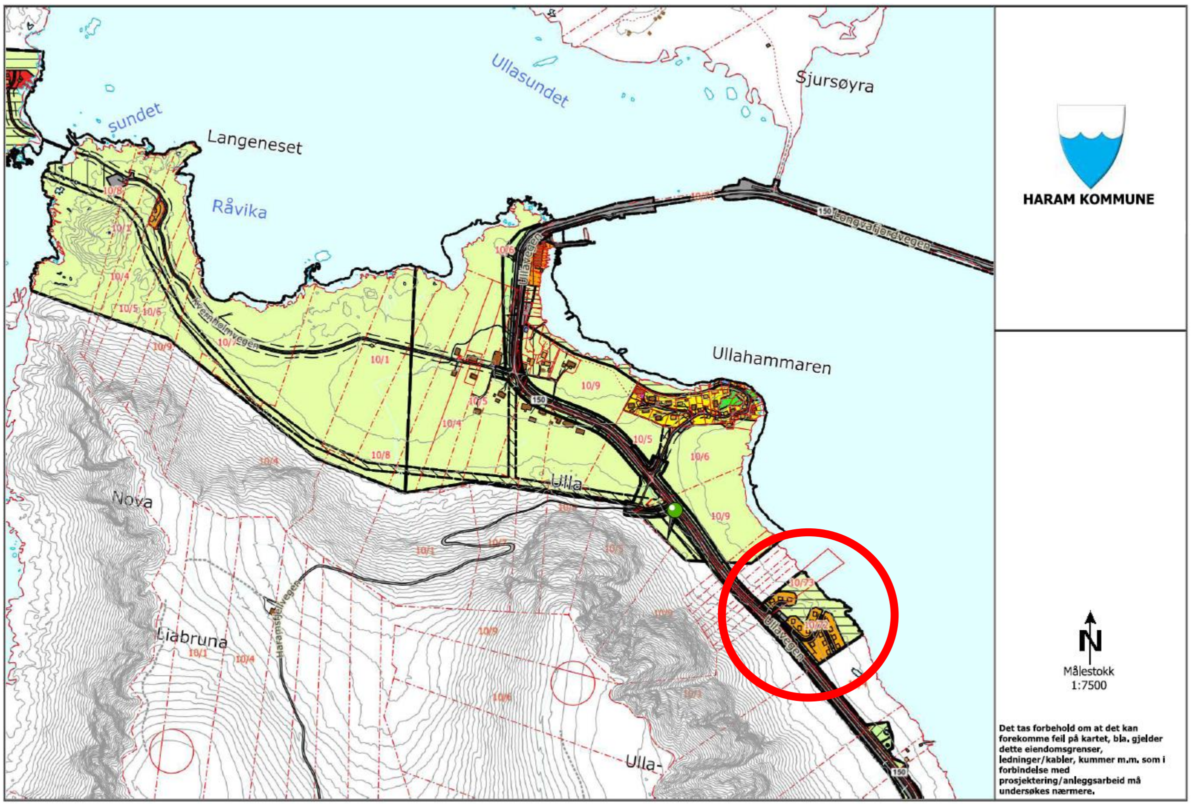
Koordinatene er gitt i WGS84 UTM32.

#	Øst	Nord	Kommentar	#	Øst	Nord	Kommentar
A	357490	6950111	Bolig	AR	356469	6952988	Bolig
B	357263	6949868	Bolig	AS	356478	6952987	Bolig
C	355912	6950483	Bolig	AT	356159	6952982	Bolig
D	356455	6952956	Bolig	AU	356602	6950288	Bolig
E	356503	6952972	Bolig	AV	357454	6950166	Bolig
F	356167	6950459	Bolig	AW	355877	6950490	Bolig
G	356540	6952961	Bolig	AX	356095	6953023	Bolig
H	356488	6952946	Bolig	AY	355345	6950425	Bolig
I	356104	6952943	Bolig	AZ	356476	6950266	Bolig
J	357295	6949890	Bolig	BA	356863	6950240	Bolig
K	356599	6950309	Bolig	BB	355782	6950531	Bolig
L	357235	6950105	Bolig	BC	356794	6950258	Bolig
M	355937	6950470	Bolig	BD	355547	6950425	Bolig
N	357418	6949949	Bolig	BE	356073	6950329	Bolig
O	356007	6950290	Bolig	BF	356264	6953051	Bolig
P	355974	6950315	Bolig	BG	356337	6950438	Bolig
Q	355685	6950564	Bolig	BH	355363	6953382	Bolig
R	357452	6950125	Bolig	BI	356256	6953071	Feriebolig
S	356598	6952952	Bolig	BJ	356626	6952977	Feriebolig
T	357384	6949967	Bolig	BK	357083	6952151	Feriebolig
U	357343	6949843	Bolig	BL	356730	6952960	Feriebolig
V	357500	6949860	Bolig	BM	356709	6952932	Feriebolig
W	356687	6952944	Bolig	BN	356024	6950273	Feriebolig
X	356317	6953050	Bolig	BO	356713	6952953	Feriebolig
Y	356214	6950257	Bolig	BP	356717	6952961	Feriebolig
Z	357507	6950041	Bolig	BQ	356632	6952931	Feriebolig
AA	356944	6950208	Bolig	BR	356646	6952988	Feriebolig
AB	356431	6950353	Bolig	BS	356551	6952929	Feriebolig
AC	355814	6950526	Bolig	BT	355874	6950349	Feriebolig
AD	356348	6950278	Bolig	BU	355863	6953093	Feriebolig
AE	356648	6952960	Bolig	BV	356580	6952934	Feriebolig
AF	356516	6952929	Bolig	BW	356567	6952961	Feriebolig
AG	356135	6950453	Bolig	BX	356642	6952940	Feriebolig
AH	357070	6950192	Bolig	BY	356671	6952938	Feriebolig
AI	357282	6950054	Bolig	BZ	355030	6953694	Feriebolig
AJ	356114	6950453	Bolig	CA	356228	6953055	Feriebolig
AK	356715	6950269	Bolig	CB	356711	6952980	Feriebolig
AL	356115	6950290	Bolig	CC	355834	6950356	Feriebolig
AM	356289	6952926	Bolig	CD	356670	6952989	Feriebolig
AN	355668	6950529	Bolig	CE	355629	6950575	Feriebolig
AO	356051	6953030	Bolig	CF	356679	6952912	Feriebolig
AP	356465	6950343	Bolig	CG	356687	6952928	Feriebolig
AQ	356253	6952942	Bolig				

5 Vedlegg B: Koordinater på planlagte hyttefelt

Koordinatene er gitt i WGS84 UTM32.

#	Øst	Nord	Eiendom
CH	356 776	6 952 506	10/73
CI	356 793	6 952 516	10/73
CJ	356 813	6 952 516	10/73
CK	356 821	6 952 464	10/72
CL	356 836	6 952 449	10/72
CM	356 856	6 952 444	10/72
CN	356 864	6 952 464	10/72
CO	356 872	6 952 482	10/72
CP	356 868	6 952 409	10/72
CQ	356 887	6 952 429	10/72
CR	356 898	6 952 463	10/72
CS	356 905	6 952 444	10/72
CT	356 893	6 952 412	10/72
CU	356 915	6 952 425	10/72
CV	356 901	6 952 391	10/72
CW	356 921	6 952 404	10/72



Figur B-1: Oversikt over planlagte hitter ved Ullavegen (eiendom 10/72 og 10/73) er markert med rød sirkel. Oversiktskart er levert av kunden.

6 Vedlegg C: Endring i avstand fra bygg til turbiner ved endring av turbinplassering

Tabell 6-1: Endring i avstand [m] fra hvert bygg til hver av de 8 turbinene ved layoutendring fra mai 2019 til april 2020. Negativt tall betyr at turbinen har kommet nærmere.

Bygg	Turbin							
#	1	2	3	4	5	6	7	8
A	83	93	83	86	12	0	0	72
B	89	76	62	90	12	0	0	66
C	101	8	-36	91	7	0	0	9
D	-48	126	106	-93	-10	0	0	-32
E	-47	127	110	-91	-10	0	0	-30
F	99	33	-4	94	9	0	0	26
G	-45	130	113	-90	-10	0	0	-28
H	-46	128	109	-91	-10	0	0	-31
I	-65	103	72	-92	-11	0	0	-49
J	89	78	65	90	12	0	0	66
K	94	60	36	95	10	0	0	50
L	87	83	71	89	12	0	0	68
M	101	10	-33	92	7	0	0	10
N	86	84	73	88	12	0	0	69
O	101	12	-26	93	8	0	0	18
P	101	9	-30	92	8	0	0	16
Q	102	-16	-66	87	6	0	0	-7
R	84	92	82	86	12	0	0	72
S	-42	132	117	-87	-9	0	0	-25
T	87	84	72	88	12	0	0	69
U	89	78	65	89	12	0	0	67
V	86	84	73	87	12	0	0	70
W	-39	136	123	-82	-8	0	0	-21
X	-59	114	91	-95	-11	0	0	-39
Y	99	29	-4	95	9	0	0	30
Z	84	91	81	86	12	0	0	71
AA	90	75	58	92	11	0	0	62
AB	96	50	22	95	10	0	0	42
AC	102	-2	-49	89	6	0	0	1
AD	98	41	10	95	9	0	0	37
AE	-41	134	120	-85	-9	0	0	-23
AF	-44	130	112	-90	-10	0	0	-29
AG	99	30	-8	94	8	0	0	24
AH	88	80	65	91	11	0	0	65
AI	87	83	71	89	12	0	0	68
AJ	100	28	-11	94	8	0	0	22
AK	93	65	44	94	11	0	0	55
AL	100	22	-14	94	8	0	0	24
AM	-54	117	92	-95	-11	0	0	-40
AN	102	-19	-68	87	6	0	0	-7
AO	-71	94	64	-92	-11	0	0	-50
AP	96	52	25	95	10	0	0	44
AQ	-57	114	88	-95	-11	0	0	-42

AR	-49	125	106	-92	-10	0	0	-32
AS	-49	126	107	-92	-10	0	0	-31
AT	-63	105	77	-94	-11	0	0	-46
AU	94	59	35	95	10	0	0	50
AV	83	94	84	86	12	0	0	72
AW	101	4	-41	91	7	0	0	6
AX	-69	98	69	-93	-11	0	0	-48
AY	99	-55	-99	81	4	0	0	-18
AZ	96	50	23	95	10	0	0	44
BA	91	72	54	93	11	0	0	60
BB	102	-5	-53	89	6	0	0	-1
BC	92	69	50	94	11	0	0	58
BD	101	-34	-79	85	5	0	0	-9
BE	100	19	-18	93	8	0	0	21
BF	-61	110	86	-95	-11	0	0	-41
BG	97	47	15	95	9	0	0	37
BH	-101	19	-6	-76	-12	0	0	-65
BI	-62	109	84	-95	-11	0	0	-42
BJ	-42	133	118	-86	-9	0	0	-24
BK	17	159	164	15	2	0	0	28
BL	-38	137	125	-80	-8	0	0	-19
BM	-37	137	125	-81	-8	0	0	-19
BN	101	13	-25	93	8	0	0	19
BO	-38	137	125	-81	-8	0	0	-19
BP	-38	137	125	-81	-8	0	0	-19
BQ	-40	135	120	-85	-9	0	0	-23
BR	-42	133	119	-85	-9	0	0	-23
BS	-43	131	115	-89	-9	0	0	-27
BT	102	0	-41	91	7	0	0	10
BU	-83	74	42	-86	-12	0	0	-56
BV	-42	132	117	-87	-9	0	0	-26
BW	-44	131	115	-88	-9	0	0	-27
BX	-40	135	121	-84	-9	0	0	-23
BY	-39	136	123	-83	-9	0	0	-21
BZ	-102	-6	-23	-75	-12	0	0	-68
CA	-63	108	82	-95	-11	0	0	-43
CB	-40	136	123	-82	-8	0	0	-20
CC	102	-4	-46	91	7	0	0	7
CD	-41	134	121	-84	-9	0	0	-22
CE	102	-23	-74	85	5	0	0	-11
CF	-37	137	124	-82	-8	0	0	-21
CG	-38	137	124	-82	-8	0	0	-20
CH	-9	153	148	-45	-6	0	0	-7
CI	-9	153	148	-44	-6	0	0	-6
CJ	-9	153	149	-43	-6	0	0	-5
CK	-5	155	151	-35	-5	0	0	-3
CL	-4	155	152	-32	-5	0	0	-1
CM	-4	155	153	-30	-4	0	0	1

CN	-5	155	153	-33	-4	0	0	0
CO	-6	155	152	-35	-5	0	0	0
CP	-1	156	155	-24	-4	0	0	3
CQ	-2	156	155	-26	-4	0	0	3
CR	-4	155	154	-31	-4	0	0	2
CS	-3	156	155	-28	-4	0	0	4
CT	-1	156	155	-24	-4	0	0	4
CU	-1	156	155	-24	-3	0	0	5
CV	1	157	156	-20	-3	0	0	5
CW	0	157	156	-21	-3	0	0	6

7 Vedlegg D: WindPRO uttskrifter for støyberegninger

Rekkefølgen på WindPRO-utskriftene under:

- NORD2000 beregninger for layout fra mai 2019 (MTA) med PO1 modus på alle turbiner.
- NORD2000 beregninger for layout fra april 2020 (T1A) med PO1 modus på alle turbiner.
- NORD2000 beregninger for layout fra april 2020 (T1A) med støyreduserende modus på utvalgte turbiner. Det alternative caset.

Project:
2019_05_HaramFjellet

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Calculated:
2019-05-24 10:56/3.2.744

NORD2000 - Main Result

Calculation: 2019_05_Haramsfjellet 8 x V136 HH 82 m New layout, Relevant NSA, PO1

Assumptions

Weather stability	
Relative humidity	70.0 %
Air temperature	10.0 °C
Height for air temperature	2.0 m
Stability parameters	Night;Clear sky
Inverse Monin Obukhov lenght	0.0100
Temperature scale T*	0.0500
Terrain	
Elevation based on object	
Height Contours: Haram_Height.map (2)	
Uniform roughness length	0.0500 m
Uniform roughness class	1.4
Uniform terrain type	D
Wind speed criteria	
Uniform wind speed at 10 m agl.	
Wind speed	Max noise wind speed
Max noise wind speed	All receptors downwind
Wind direction	4.0 m
Height above ground level for receiver	
Wind speed has been extrapolated to calculation height using	
IEC profile shear (z0 = 0.05m)	
No stability correction	5.022
Version	

All coordinates are in
UTM WGS84 Zone: 32

Scale 1:75,000
New WTG   Noise sensitive area

WTGs

					WTG type							Noise data	
	X(East)	Y(North)	Z	Row data/Description	Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Setting	Creator	Name
			[m]					[kW]	[m]	[m]			
1	355,408	6,952,169	270.0	VESTAS V136-4.2 420...	Yes	VESTAS	V136-4.2-4,200	4,200	136.0	82.0	Day	USER	Haramsfjellet_2019_03
											Evening	USER	Haramsfjellet_2019_03
											Night	USER	Haramsfjellet_2019_03
2	355,452	6,951,811	251.1	VESTAS V136-4.2 420...	Yes	VESTAS	V136-4.2-4,200	4,200	136.0	82.0	Day	USER	Haramsfjellet_2019_03
											Evening	USER	Haramsfjellet_2019_03
											Night	USER	Haramsfjellet_2019_03
3	355,787	6,951,697	245.0	VESTAS V136-4.2 420...	Yes	VESTAS	V136-4.2-4,200	4,200	136.0	82.0	Day	USER	Haramsfjellet_2019_03
											Evening	USER	Haramsfjellet_2019_03
											Night	USER	Haramsfjellet_2019_03
4	356,322	6,952,279	324.5	VESTAS V136-4.2 420...	Yes	VESTAS	V136-4.2-4,200	4,200	136.0	82.0	Day	USER	Haramsfjellet_2019_03
											Evening	USER	Haramsfjellet_2019_03
											Night	USER	Haramsfjellet_2019_03
5	356,463	6,951,917	330.0	VESTAS V136-4.2 420...	Yes	VESTAS	V136-4.2-4,200	4,200	136.0	82.0	Day	USER	Haramsfjellet_2019_03
											Evening	USER	Haramsfjellet_2019_03
											Night	USER	Haramsfjellet_2019_03
6	356,717	6,951,604	292.3	VESTAS V136-4.2 420...	Yes	VESTAS	V136-4.2-4,200	4,200	136.0	82.0	Day	USER	Haramsfjellet_2019_03
											Evening	USER	Haramsfjellet_2019_03
											Night	USER	Haramsfjellet_2019_03
7	357,038	6,951,221	310.0	VESTAS V136-4.2 420...	Yes	VESTAS	V136-4.2-4,200	4,200	136.0	82.0	Day	USER	Haramsfjellet_2019_03
											Evening	USER	Haramsfjellet_2019_03
											Night	USER	Haramsfjellet_2019_03
8	356,315	6,951,556	285.7	VESTAS V136-4.2 420...	Yes	VESTAS	V136-4.2-4,200	4,200	136.0	82.0	Day	USER	Haramsfjellet_2019_03
											Evening	USER	Haramsfjellet_2019_03
											Night	USER	Haramsfjellet_2019_03

Calculation Results

Sound level

Noise sensitive area						Demands	Sound level	Demands fulfilled?
No.	Name	X(East)	Y(North)	Z	Imission height	Noise	From WTGs	Noise
				[m]	[m]	[dB(A)]	[dB(A)]	[dB(A)]
A	Noise sensitive point: Demands defined in calculation setup. (733)	357,490	6,950,111	17.4	4.0	45.0	18.6	Yes
A	Day						12.2	
A	Evening						12.2	
A	Night						12.2	
B	Noise sensitive point: Demands defined in calculation setup. (734)	357,263	6,949,868	5.7	4.0	45.0	29.0	Yes
B	Day						22.6	

To be continued on next page...

NORD2000 - Main Result

Calculation: 2019_05_Haramsfjellet 8 x V136 HH 82 m New layout, Relevant NSA, PO1

...continued from previous page

Noise sensitive area						Demands	Sound level	Demands fulfilled?
No.	Name	X(East)	Y(North)	Z	Imission height	Noise	From WTGs	Noise
				[m]	[m]	[dB(A)]	[dB(A)]	[dB(A)]
B	Evening						22.6	
B	Night						22.6	
C	Noise sensitive point: Demands defined in calculation setup. (735)	355,912	6,950,483	11.7	4.0	45.0	44.1	Yes
C	Day						37.7	
C	Evening						37.7	
C	Night						37.7	
D	Noise sensitive point: Demands defined in calculation setup. (736)	356,455	6,952,956	7.7	4.0	45.0	43.8	Yes
D	Day						37.4	
D	Evening						37.4	
D	Night						37.4	
E	Noise sensitive point: Demands defined in calculation setup. (737)	356,503	6,952,972	6.4	4.0	45.0	43.5	Yes
E	Day						37.1	
E	Evening						37.1	
E	Night						37.1	
F	Noise sensitive point: Demands defined in calculation setup. (738)	356,167	6,950,459	16.7	4.0	45.0	34.8	Yes
F	Day						28.4	
F	Evening						28.4	
F	Night						28.4	
G	Noise sensitive point: Demands defined in calculation setup. (739)	356,540	6,952,961	10.0	4.0	45.0	43.6	Yes
G	Day						37.2	
G	Evening						37.2	
G	Night						37.2	
H	Noise sensitive point: Demands defined in calculation setup. (740)	356,488	6,952,946	10.5	4.0	45.0	44.3	Yes
H	Day						37.9	
H	Evening						37.9	
H	Night						37.9	
I	Noise sensitive point: Demands defined in calculation setup. (741)	356,104	6,952,943	9.8	4.0	45.0	44.6	Yes
I	Day						38.2	
I	Evening						38.2	
I	Night						38.2	
J	Noise sensitive point: Demands defined in calculation setup. (742)	357,295	6,949,890	6.8	4.0	45.0	28.7	Yes
J	Day						22.3	
J	Evening						22.3	
J	Night						22.3	
K	Noise sensitive point: Demands defined in calculation setup. (743)	356,599	6,950,309	16.3	4.0	45.0	20.9	Yes
K	Day						14.5	
K	Evening						14.5	
K	Night						14.5	
L	Noise sensitive point: Demands defined in calculation setup. (744)	357,235	6,950,105	12.7	4.0	45.0	19.7	Yes
L	Day						13.3	
L	Evening						13.3	
L	Night						13.3	
M	Noise sensitive point: Demands defined in calculation setup. (745)	355,937	6,950,470	11.1	4.0	45.0	43.8	Yes
M	Day						37.4	
M	Evening						37.4	
M	Night						37.4	
N	Noise sensitive point: Demands defined in calculation setup. (746)	357,418	6,949,949	11.5	4.0	45.0	22.1	Yes
N	Day						15.7	
N	Evening						15.7	
N	Night						15.7	
O	Noise sensitive point: Demands defined in calculation setup. (747)	356,007	6,950,290	2.4	4.0	45.0	42.8	Yes
O	Day						36.4	
O	Evening						36.4	
O	Night						36.4	
P	Noise sensitive point: Demands defined in calculation setup. (748)	355,974	6,950,315	2.8	4.0	45.0	43.4	Yes
P	Day						37.0	
P	Evening						37.0	
P	Night						37.0	
Q	Noise sensitive point: Demands defined in calculation setup. (749)	355,685	6,950,564	15.0	4.0	45.0	44.1	Yes
Q	Day						37.7	
Q	Evening						37.7	
Q	Night						37.7	
R	Noise sensitive point: Demands defined in calculation setup. (750)	357,452	6,950,125	17.0	4.0	45.0	19.3	Yes
R	Day						12.9	
R	Evening						12.9	
R	Night						12.9	
S	Noise sensitive point: Demands defined in calculation setup. (751)	356,598	6,952,952	10.0	4.0	45.0	44.4	Yes

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Calculated:
2019-05-24 10:56/3.2.744

NORD2000 - Main Result

Calculation: 2019_05_Haramsfjellet 8 x V136 HH 82 m New layout, Relevant NSA, PO1

...continued from previous page

Noise sensitive area						**Demands**	**Sound level**	**Demands fulfilled?**
No.	Name	X(East)	Y(North)	Z	Imission height	Noise	From WTGs	Noise
				[m]	[m]	[dB(A)]	[dB(A)]	[dB(A)]
S	Day						38.0	
S	Evening						38.0	
S	Night						38.0	
T	Noise sensitive point: Demands defined in calculation setup. (752)	357,384	6,949,967	11.1	4.0	45.0	21.9	Yes
T	Day						15.5	
T	Evening						15.5	
T	Night						15.5	
U	Noise sensitive point: Demands defined in calculation setup. (753)	357,343	6,949,843	9.6	4.0	45.0	29.0	Yes
U	Day						22.6	
U	Evening						22.6	
U	Night						22.6	
V	Noise sensitive point: Demands defined in calculation setup. (754)	357,500	6,949,860	10.9	4.0	45.0	28.6	Yes
V	Day						22.2	
V	Evening						22.2	
V	Night						22.2	
W	Noise sensitive point: Demands defined in calculation setup. (755)	356,687	6,952,944	10.4	4.0	45.0	44.9	Yes
W	Day						38.5	
W	Evening						38.5	
W	Night						38.5	
X	Noise sensitive point: Demands defined in calculation setup. (756)	356,317	6,953,050	1.9	4.0	45.0	43.5	Yes
X	Day						37.1	
X	Evening						37.1	
X	Night						37.1	
Y	Noise sensitive point: Demands defined in calculation setup. (757)	356,214	6,950,257	5.8	4.0	45.0	40.8	Yes
Y	Day						34.4	
Y	Evening						34.4	
Y	Night						34.4	
Z	Noise sensitive point: Demands defined in calculation setup. (758)	357,507	6,950,041	16.1	4.0	45.0	19.4	Yes
Z	Day						13.1	
Z	Evening						13.1	
Z	Night						13.1	
AA	Noise sensitive point: Demands defined in calculation setup. (759)	356,944	6,950,208	14.8	4.0	45.0	20.6	Yes
AA	Day						14.2	
AA	Evening						14.2	
AA	Night						14.2	
AB	Noise sensitive point: Demands defined in calculation setup. (760)	356,431	6,950,353	15.0	4.0	45.0	34.2	Yes
AB	Day						27.8	
AB	Evening						27.8	
AB	Night						27.8	
AC	Noise sensitive point: Demands defined in calculation setup. (761)	355,814	6,950,526	12.0	4.0	45.0	44.3	Yes
AC	Day						37.9	
AC	Evening						37.9	
AC	Night						37.9	
AD	Noise sensitive point: Demands defined in calculation setup. (762)	356,348	6,950,278	10.0	4.0	45.0	37.3	Yes
AD	Day						30.9	
AD	Evening						30.9	
AD	Night						30.9	
AE	Noise sensitive point: Demands defined in calculation setup. (763)	356,648	6,952,960	13.1	4.0	45.0	43.9	Yes
AE	Day						37.5	
AE	Evening						37.5	
AE	Night						37.5	
AF	Noise sensitive point: Demands defined in calculation setup. (764)	356,516	6,952,929	15.0	4.0	45.0	43.9	Yes
AF	Day						37.5	
AF	Evening						37.5	
AF	Night						37.5	
AG	Noise sensitive point: Demands defined in calculation setup. (765)	356,135	6,950,453	15.0	4.0	45.0	24.1	Yes
AG	Day						17.7	
AG	Evening						17.7	
AG	Night						17.7	
AH	Noise sensitive point: Demands defined in calculation setup. (766)	357,070	6,950,192	15.2	4.0	45.0	20.8	Yes
AH	Day						14.4	
AH	Evening						14.4	
AH	Night						14.4	
AI	Noise sensitive point: Demands defined in calculation setup. (767)	357,282	6,950,054	12.0	4.0	45.0	20.1	Yes
AI	Day						13.7	
AI	Evening						13.7	
AI	Night						13.7	

To be continued on next page...

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2019-05-24 10:56/3.2.744

NORD2000 - Main Result

Calculation: 2019_05_Haramsfjellet 8 x V136 HH 82 m New layout, Relevant NSA, PO1

...continued from previous page

Noise sensitive area						**Demands**	**Sound level**	**Demands fulfilled?**
No.	Name	X(East)	Y(North)	Z	Imission height	Noise	From WTGs	Noise
				[m]	[m]	[dB(A)]	[dB(A)]	[dB(A)]
AJ	Noise sensitive point: Demands defined in calculation setup. (768)	356,114	6,950,453	14.3	4.0	45.0	23.9	Yes
AJ	Day						17.5	
AJ	Evening						17.5	
AJ	Night						17.5	
AK	Noise sensitive point: Demands defined in calculation setup. (769)	356,715	6,950,269	15.8	4.0	45.0	21.5	Yes
AK	Day						15.1	
AK	Evening						15.1	
AK	Night						15.1	
AL	Noise sensitive point: Demands defined in calculation setup. (770)	356,115	6,950,290	5.7	4.0	45.0	41.9	Yes
AL	Day						35.5	
AL	Evening						35.5	
AL	Night						35.5	
AM	Noise sensitive point: Demands defined in calculation setup. (771)	356,289	6,952,926	9.6	4.0	45.0	40.7	Yes
AM	Day						34.3	
AM	Evening						34.3	
AM	Night						34.3	
AN	Noise sensitive point: Demands defined in calculation setup. (772)	355,668	6,950,529	13.4	4.0	45.0	43.6	Yes
AN	Day						37.2	
AN	Evening						37.2	
AN	Night						37.2	
AO	Noise sensitive point: Demands defined in calculation setup. (773)	356,051	6,953,030	5.0	4.0	45.0	43.5	Yes
AO	Day						37.1	
AO	Evening						37.1	
AO	Night						37.1	
AP	Noise sensitive point: Demands defined in calculation setup. (774)	356,465	6,950,343	15.0	4.0	45.0	31.5	Yes
AP	Day						25.1	
AP	Evening						25.1	
AP	Night						25.1	
AQ	Noise sensitive point: Demands defined in calculation setup. (775)	356,253	6,952,942	8.3	4.0	45.0	40.7	Yes
AQ	Day						34.3	
AQ	Evening						34.3	
AQ	Night						34.3	
AR	Noise sensitive point: Demands defined in calculation setup. (776)	356,469	6,952,988	3.5	4.0	45.0	43.7	Yes
AR	Day						37.3	
AR	Evening						37.3	
AR	Night						37.3	
AS	Noise sensitive point: Demands defined in calculation setup. (777)	356,478	6,952,987	3.7	4.0	45.0	43.8	Yes
AS	Day						37.4	
AS	Evening						37.4	
AS	Night						37.4	
AT	Noise sensitive point: Demands defined in calculation setup. (778)	356,159	6,952,982	6.6	4.0	45.0	43.7	Yes
AT	Day						37.3	
AT	Evening						37.3	
AT	Night						37.3	
AU	Noise sensitive point: Demands defined in calculation setup. (779)	356,602	6,950,288	15.0	4.0	45.0	21.7	Yes
AU	Day						15.3	
AU	Evening						15.3	
AU	Night						15.3	
AV	Noise sensitive point: Demands defined in calculation setup. (780)	357,454	6,950,166	18.8	4.0	45.0	18.7	Yes
AV	Day						12.3	
AV	Evening						12.3	
AV	Night						12.3	
AW	Noise sensitive point: Demands defined in calculation setup. (781)	355,877	6,950,490	11.6	4.0	45.0	43.8	Yes
AW	Day						37.4	
AW	Evening						37.4	
AW	Night						37.4	
AX	Noise sensitive point: Demands defined in calculation setup. (782)	356,095	6,953,023	5.3	4.0	45.0	44.2	Yes
AX	Day						37.8	
AX	Evening						37.8	
AX	Night						37.8	
AY	Noise sensitive point: Demands defined in calculation setup. (783)	355,345	6,950,425	8.3	4.0	45.0	42.3	Yes
AY	Day						35.9	
AY	Evening						35.9	
AY	Night						35.9	
AZ	Noise sensitive point: Demands defined in calculation setup. (784)	356,476	6,950,266	11.3	4.0	45.0	36.7	Yes
AZ	Day						30.3	
AZ	Evening						30.3	

To be continued on next page...

NORD2000 - Main Result

Calculation: 2019_05_Haramsfjellet 8 x V136 HH 82 m New layout, Relevant NSA, PO1

...continued from previous page

Noise sensitive area						**Demands**	**Sound level**	**Demands fulfilled?**
No.	Name	X(East)	Y(North)	Z	Imission height	Noise	From WTGs	Noise
				[m]	[m]	[dB(A)]	[dB(A)]	[dB(A)]
AZ	Night						30.3	
BA	Noise sensitive point: Demands defined in calculation setup. (785)	356,863	6,950,240	15.1	4.0	45.0	20.4	Yes
BA	Day						14.0	
BA	Evening						14.0	
BA	Night						14.0	
BB	Noise sensitive point: Demands defined in calculation setup. (786)	355,782	6,950,531	10.1	4.0	45.0	44.3	Yes
BB	Day						37.9	
BB	Evening						37.9	
BB	Night						37.9	
BC	Noise sensitive point: Demands defined in calculation setup. (787)	356,794	6,950,258	15.6	4.0	45.0	20.6	Yes
BC	Day						14.2	
BC	Evening						14.2	
BC	Night						14.2	
BD	Noise sensitive point: Demands defined in calculation setup. (788)	355,547	6,950,425	8.6	4.0	45.0	43.1	Yes
BD	Day						36.7	
BD	Evening						36.7	
BD	Night						36.7	
BE	Noise sensitive point: Demands defined in calculation setup. (789)	356,073	6,950,329	6.2	4.0	45.0	42.6	Yes
BE	Day						36.2	
BE	Evening						36.2	
BE	Night						36.2	
BF	Noise sensitive point: Demands defined in calculation setup. (846)	356,264	6,953,051	3.1	4.0	45.0	43.2	Yes
BF	Day						36.8	
BF	Evening						36.8	
BF	Night						36.8	
BG	Noise sensitive point: Demands defined in calculation setup. (847)	356,337	6,950,438	20.0	4.0	45.0	37.4	Yes
BG	Day						31.0	
BG	Evening						31.0	
BG	Night						31.0	
BH	Noise sensitive point: Demands defined in calculation setup. (848)	355,363	6,953,382	13.3	4.0	45.0	42.1	Yes
BH	Day						35.7	
BH	Evening						35.7	
BH	Night						35.7	
BI	Noise sensitive point: Demands defined in calculation setup. (849)	356,256	6,953,071	2.4	4.0	45.0	43.2	Yes
BI	Day						36.8	
BI	Evening						36.8	
BI	Night						36.8	
BJ	Noise sensitive point: Demands defined in calculation setup. (850)	356,626	6,952,977	8.4	4.0	45.0	44.2	Yes
BJ	Day						37.8	
BJ	Evening						37.8	
BJ	Night						37.8	
BK	Noise sensitive point: Demands defined in calculation setup. (851)	357,083	6,952,151	9.2	4.0	45.0	47.0	No
BK	Day						40.6	
BK	Evening						40.6	
BK	Night						40.6	
BL	Noise sensitive point: Demands defined in calculation setup. (852)	356,730	6,952,960	5.2	4.0	45.0	43.9	Yes
BL	Day						37.5	
BL	Evening						37.5	
BL	Night						37.5	
BM	Noise sensitive point: Demands defined in calculation setup. (853)	356,709	6,952,932	6.5	4.0	45.0	44.7	Yes
BM	Day						38.3	
BM	Evening						38.3	
BM	Night						38.3	
BN	Noise sensitive point: Demands defined in calculation setup. (854)	356,024	6,950,273	1.9	4.0	45.0	42.6	Yes
BN	Day						36.2	
BN	Evening						36.2	
BN	Night						36.2	
BO	Noise sensitive point: Demands defined in calculation setup. (855)	356,713	6,952,953	8.5	4.0	45.0	44.4	Yes
BO	Day						38.0	
BO	Evening						38.0	
BO	Night						38.0	
BP	Noise sensitive point: Demands defined in calculation setup. (856)	356,717	6,952,961	8.4	4.0	45.0	44.3	Yes
BP	Day						37.9	
BP	Evening						37.9	
BP	Night						37.9	
BQ	Noise sensitive point: Demands defined in calculation setup. (857)	356,632	6,952,931	10.0	4.0	45.0	44.5	Yes
BQ	Day						38.1	

To be continued on next page...

NORD2000 - Main Result

Calculation: 2019_05_Haramsfjellet 8 x V136 HH 82 m New layout, Relevant NSA, PO1

...continued from previous page

Noise sensitive area						**Demands**	**Sound level**	**Demands fulfilled?**
No.	Name	X(East)	Y(North)	Z	Imission height	Noise	From WTGs	Noise
				[m]	[m]	[dB(A)]	[dB(A)]	[dB(A)]
BQ	Evening						38.1	
BQ	Night						38.1	
BR	Noise sensitive point: Demands defined in calculation setup. (858)	356,646	6,952,988	5.5	4.0	45.0	43.9	Yes
BR	Day						37.5	
BR	Evening						37.5	
BR	Night						37.5	
BS	Noise sensitive point: Demands defined in calculation setup. (859)	356,551	6,952,929	15.0	4.0	45.0	43.8	Yes
BS	Day						37.4	
BS	Evening						37.4	
BS	Night						37.4	
BT	Noise sensitive point: Demands defined in calculation setup. (860)	355,874	6,950,349	4.3	4.0	45.0	43.4	Yes
BT	Day						37.0	
BT	Evening						37.0	
BT	Night						37.0	
BU	Noise sensitive point: Demands defined in calculation setup. (861)	355,863	6,953,093	9.1	4.0	45.0	44.1	Yes
BU	Day						37.8	
BU	Evening						37.8	
BU	Night						37.8	
BV	Noise sensitive point: Demands defined in calculation setup. (862)	356,580	6,952,934	12.2	4.0	45.0	44.8	Yes
BV	Day						38.4	
BV	Evening						38.4	
BV	Night						38.4	
BW	Noise sensitive point: Demands defined in calculation setup. (863)	356,567	6,952,961	10.9	4.0	45.0	44.5	Yes
BW	Day						38.1	
BW	Evening						38.1	
BW	Night						38.1	
BX	Noise sensitive point: Demands defined in calculation setup. (864)	356,642	6,952,940	11.3	4.0	45.0	44.4	Yes
BX	Day						38.0	
BX	Evening						38.0	
BX	Night						38.0	
BY	Noise sensitive point: Demands defined in calculation setup. (865)	356,671	6,952,938	12.1	4.0	45.0	45.3	No
BY	Day						38.9	
BY	Evening						38.9	
BY	Night						38.9	
BZ	Noise sensitive point: Demands defined in calculation setup. (866)	355,030	6,953,694	3.6	4.0	45.0	40.0	Yes
BZ	Day						33.6	
BZ	Evening						33.6	
BZ	Night						33.6	
CA	Noise sensitive point: Demands defined in calculation setup. (867)	356,228	6,953,055	3.8	4.0	45.0	43.3	Yes
CA	Day						36.9	
CA	Evening						36.9	
CA	Night						36.9	
CB	Noise sensitive point: Demands defined in calculation setup. (868)	356,711	6,952,980	7.8	4.0	45.0	44.2	Yes
CB	Day						37.8	
CB	Evening						37.8	
CB	Night						37.8	
CC	Noise sensitive point: Demands defined in calculation setup. (869)	355,834	6,950,356	4.6	4.0	45.0	43.7	Yes
CC	Day						37.3	
CC	Evening						37.3	
CC	Night						37.3	
CD	Noise sensitive point: Demands defined in calculation setup. (870)	356,670	6,952,989	10.1	4.0	45.0	43.8	Yes
CD	Day						37.4	
CD	Evening						37.4	
CD	Night						37.4	
CE	Noise sensitive point: Demands defined in calculation setup. (871)	355,629	6,950,575	10.6	4.0	45.0	43.9	Yes
CE	Day						37.5	
CE	Evening						37.5	
CE	Night						37.5	
CF	Noise sensitive point: Demands defined in calculation setup. (872)	356,679	6,952,912	6.0	4.0	45.0	44.6	Yes
CF	Day						38.2	
CF	Evening						38.2	
CF	Night						38.2	
CG	Noise sensitive point: Demands defined in calculation setup. (873)	356,687	6,952,928	8.3	4.0	45.0	44.5	Yes
CG	Day						38.1	
CG	Evening						38.1	
CG	Night						38.1	
CH	Noise sensitive point: Norwegian - Yellow zone (908)	356,776	6,952,506	13.6	4.0	45.0	42.7	Yes

To be continued on next page...

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NORD2000 - Main Result

Calculation: 2019_05_Haramsfjellet 8 x V136 HH 82 m New layout, Relevant NSA, PO1

...continued from previous page

Noise sensitive area No.	Name	X(East)	Y(North)	Z [m]	Imission height [m]	**Demands** Noise [dB(A)]	**Sound level** From WTGs [dB(A)]	**Demands fulfilled?** Noise [dB(A)]
CH	Day						36.3	
CH	Evening						36.3	
CH	Night						36.3	
CI	Noise sensitive point: Norwegian - Yellow zone (909)	356,793	6,952,513	12.6	4.0	45.0	41.9	Yes
CI	Day						35.5	
CI	Evening						35.5	
CI	Night						35.5	
CJ	Noise sensitive point: Norwegian - Yellow zone (910)	356,813	6,952,516	11.6	4.0	45.0	42.3	Yes
CJ	Day						35.9	
CJ	Evening						35.9	
CJ	Night						35.9	
CK	Noise sensitive point: Norwegian - Yellow zone (911)	356,821	6,952,464	15.9	4.0	45.0	45.7	No
CK	Day						39.4	
CK	Evening						39.4	
CK	Night						39.4	
CL	Noise sensitive point: Norwegian - Yellow zone (912)	356,836	6,952,449	13.7	4.0	45.0	46.7	No
CL	Day						40.3	
CL	Evening						40.3	
CL	Night						40.3	
CM	Noise sensitive point: Norwegian - Yellow zone (913)	356,856	6,952,444	11.6	4.0	45.0	46.8	No
CM	Day						40.4	
CM	Evening						40.4	
CM	Night						40.4	
CN	Noise sensitive point: Norwegian - Yellow zone (914)	356,864	6,952,464	10.0	4.0	45.0	46.7	No
CN	Day						40.3	
CN	Evening						40.3	
CN	Night						40.3	
CO	Noise sensitive point: Norwegian - Yellow zone (915)	356,872	6,952,482	9.8	4.0	45.0	46.6	No
CO	Day						40.2	
CO	Evening						40.2	
CO	Night						40.2	
CP	Noise sensitive point: Norwegian - Yellow zone (916)	356,868	6,952,409	11.6	4.0	45.0	47.7	No
CP	Day						41.3	
CP	Evening						41.3	
CP	Night						41.3	
CQ	Noise sensitive point: Norwegian - Yellow zone (917)	356,887	6,952,429	9.2	4.0	45.0	46.8	No
CQ	Day						40.4	
CQ	Evening						40.4	
CQ	Night						40.4	
CR	Noise sensitive point: Norwegian - Yellow zone (918)	356,898	6,952,463	6.8	4.0	45.0	46.5	No
CR	Day						40.1	
CR	Evening						40.1	
CR	Night						40.1	
CS	Noise sensitive point: Norwegian - Yellow zone (919)	356,905	6,952,444	6.8	4.0	45.0	46.3	No
CS	Day						39.9	
CS	Evening						39.9	
CS	Night						39.9	
CT	Noise sensitive point: Norwegian - Yellow zone (920)	356,893	6,952,412	9.4	4.0	45.0	47.5	No
CT	Day						41.1	
CT	Evening						41.1	
CT	Night						41.1	
CU	Noise sensitive point: Norwegian - Yellow zone (921)	356,915	6,952,425	6.5	4.0	45.0	47.2	No
CU	Day						40.8	
CU	Evening						40.8	
CU	Night						40.8	
CV	Noise sensitive point: Norwegian - Yellow zone (922)	356,901	6,952,391	9.6	4.0	45.0	47.9	No
CV	Day						41.5	
CV	Evening						41.5	
CV	Night						41.5	
CW	Noise sensitive point: Norwegian - Yellow zone (923)	356,921	6,952,404	7.1	4.0	45.0	47.1	No
CW	Day						40.7	
CW	Evening						40.7	
CW	Night						40.7	

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NORD2000 - Main Result

Calculation: 2019_05_Haramsfjellet 8 x V136 HH 82 m New layout, Relevant NSA, PO1

Project:
2020_04_HaramFjellet_Noise_Shadow_EYA_T01

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Calculated:
2020-04-16 16:01/3.3.274

NORD2000 - Main Result

Calculation: 2020_04_Haramsfjellet 8x V136 HH 82 m TA1

Assumptions

Weather stability	
Relative humidity	70.0 %
Air temperature	10.0 °C
Height for air temperature	2.0 m
Stability parameters	Night;Clear sky
Inverse Monin Obukhov length	0.0100
Temperature scale T*	0.0500
Terrain	
Elevation based on object	
Height Contours: Haram_Height.map (2)	
Roughness based on line object	
Roughness Lines: HaramRoughness(3).map (7)	
Terrain type based on area object	
Area object (): REGIONS_2019_05_HaramFjellet_1.w2r (2)	
Month for calculation	January
Wind speed criteria	
Uniform wind speed at 10 m agl.	
Wind speed	Max noise wind speed
Max noise wind speed	All receptors downwind
Wind direction	4.0 m
Height above ground level for receiver	
Wind speed has been extrapolated to calculation height using	
IEC profile shear (z0 = 0.05m)	
No stability correction	6.004
Version	

All coordinates are in
UTM WGS84 Zone: 32

Scale 1:75,000

New WTG   Noise sensitive area

WTGs

	X(East)	Y(North)	Z	Row data/Description	WTG type Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Setting	Noise data Creator	Name
			[m]					[kW]	[m]	[m]			
1	355,427	6,952,069	270.0	VESTAS V136-4.2 420...	Yes	VESTAS	V136-4.2-4,200	4,200	136.0	82.0	Day	USER	Haramsfjellet_2019_03
											Evening	USER	Haramsfjellet_2019_03
											Night	USER	Haramsfjellet_2019_03
2	355,607	6,951,847	253.5	VESTAS V136-4.2 420...	Yes	VESTAS	V136-4.2-4,200	4,200	136.0	82.0	Day	USER	Haramsfjellet_2019_03
											Evening	USER	Haramsfjellet_2019_03
											Night	USER	Haramsfjellet_2019_03
3	355,946	6,951,739	248.5	VESTAS V136-4.2 420...	Yes	VESTAS	V136-4.2-4,200	4,200	136.0	82.0	Day	USER	Haramsfjellet_2019_03
											Evening	USER	Haramsfjellet_2019_03
											Night	USER	Haramsfjellet_2019_03
4	356,327	6,952,184	326.0	VESTAS V136-4.2 420...	Yes	VESTAS	V136-4.2-4,200	4,200	136.0	82.0	Day	USER	Haramsfjellet_2019_03
											Evening	USER	Haramsfjellet_2019_03
											Night	USER	Haramsfjellet_2019_03
5	356,469	6,951,907	330.0	VESTAS V136-4.2 420...	Yes	VESTAS	V136-4.2-4,200	4,200	136.0	82.0	Day	USER	Haramsfjellet_2019_03
											Evening	USER	Haramsfjellet_2019_03
											Night	USER	Haramsfjellet_2019_03
6	356,717	6,951,604	292.3	VESTAS V136-4.2 420...	Yes	VESTAS	V136-4.2-4,200	4,200	136.0	82.0	Day	USER	Haramsfjellet_2019_03
											Evening	USER	Haramsfjellet_2019_03
											Night	USER	Haramsfjellet_2019_03
7	357,038	6,951,221	310.0	VESTAS V136-4.2 420...	Yes	VESTAS	V136-4.2-4,200	4,200	136.0	82.0	Day	USER	Haramsfjellet_2019_03
											Evening	USER	Haramsfjellet_2019_03
											Night	USER	Haramsfjellet_2019_03
8	356,383	6,951,518	286.2	VESTAS V136-4.2 420...	Yes	VESTAS	V136-4.2-4,200	4,200	136.0	82.0	Day	USER	Haramsfjellet_2019_03
											Evening	USER	Haramsfjellet_2019_03
											Night	USER	Haramsfjellet_2019_03

Calculation Results

Sound level

Noise sensitive area No.	Name	X(East)	Y(North)	Z	Imission height	Demands Noise	Sound level From WTGs	Demands fulfilled? Noise
				[m]	[m]	[dB(A)]	[dB(A)]	[dB(A)]
A	Noise sensitive point: Demands defined in calculation setup. (733)	357,490	6,950,111	17.4	4.0	45.0	18.7	Yes
A	Day						12.3	
A	Evening						12.3	
A	Night						12.3	
B	Noise sensitive point: Demands defined in calculation setup. (734)	357,263	6,949,868	5.7	4.0	45.0	27.0	Yes
B	Day						20.6	

To be continued on next page...

NORD2000 - Main Result

Calculation: 2020_04_Haramsfjellet 8x V136 HH 82 m TA1

...continued from previous page

Noise sensitive area						Demands	Sound level	Demands fulfilled?
No.	Name	X(East)	Y(North)	Z	Imission height	Noise	From WTGs	Noise
				[m]	[m]	[dB(A)]	[dB(A)]	[dB(A)]
B	Evening						20.6	
B	Night						20.6	
C	Noise sensitive point: Demands defined in calculation setup. (735)	355,912	6,950,483	11.7	4.0	45.0	44.1	Yes
C	Day						37.7	
C	Evening						37.7	
C	Night						37.7	
D	Noise sensitive point: Demands defined in calculation setup. (736)	356,455	6,952,956	7.7	4.0	45.0	43.0	Yes
D	Day						36.6	
D	Evening						36.6	
D	Night						36.6	
E	Noise sensitive point: Demands defined in calculation setup. (737)	356,503	6,952,972	6.4	4.0	45.0	42.7	Yes
E	Day						36.3	
E	Evening						36.3	
E	Night						36.3	
F	Noise sensitive point: Demands defined in calculation setup. (738)	356,167	6,950,459	16.7	4.0	45.0	34.8	Yes
F	Day						28.4	
F	Evening						28.4	
F	Night						28.4	
G	Noise sensitive point: Demands defined in calculation setup. (739)	356,540	6,952,961	10.0	4.0	45.0	42.9	Yes
G	Day						36.5	
G	Evening						36.5	
G	Night						36.5	
H	Noise sensitive point: Demands defined in calculation setup. (740)	356,488	6,952,946	10.5	4.0	45.0	43.5	Yes
H	Day						37.1	
H	Evening						37.1	
H	Night						37.1	
I	Noise sensitive point: Demands defined in calculation setup. (741)	356,104	6,952,943	9.8	4.0	45.0	43.2	Yes
I	Day						36.8	
I	Evening						36.8	
I	Night						36.8	
J	Noise sensitive point: Demands defined in calculation setup. (742)	357,295	6,949,890	6.8	4.0	45.0	23.7	Yes
J	Day						17.3	
J	Evening						17.3	
J	Night						17.3	
K	Noise sensitive point: Demands defined in calculation setup. (743)	356,599	6,950,309	16.3	4.0	45.0	21.9	Yes
K	Day						15.5	
K	Evening						15.5	
K	Night						15.5	
L	Noise sensitive point: Demands defined in calculation setup. (744)	357,235	6,950,105	12.7	4.0	45.0	19.6	Yes
L	Day						13.2	
L	Evening						13.2	
L	Night						13.2	
M	Noise sensitive point: Demands defined in calculation setup. (745)	355,937	6,950,470	11.1	4.0	45.0	44.3	Yes
M	Day						37.9	
M	Evening						37.9	
M	Night						37.9	
N	Noise sensitive point: Demands defined in calculation setup. (746)	357,418	6,949,949	11.5	4.0	45.0	21.9	Yes
N	Day						15.5	
N	Evening						15.5	
N	Night						15.5	
O	Noise sensitive point: Demands defined in calculation setup. (747)	356,007	6,950,290	2.4	4.0	45.0	42.9	Yes
O	Day						36.5	
O	Evening						36.5	
O	Night						36.5	
P	Noise sensitive point: Demands defined in calculation setup. (748)	355,974	6,950,315	2.8	4.0	45.0	43.0	Yes
P	Day						36.6	
P	Evening						36.6	
P	Night						36.6	
Q	Noise sensitive point: Demands defined in calculation setup. (749)	355,685	6,950,564	15.0	4.0	45.0	43.9	Yes
Q	Day						37.5	
Q	Evening						37.5	
Q	Night						37.5	
R	Noise sensitive point: Demands defined in calculation setup. (750)	357,452	6,950,125	17.0	4.0	45.0	20.4	Yes
R	Day						14.0	
R	Evening						14.0	
R	Night						14.0	
S	Noise sensitive point: Demands defined in calculation setup. (751)	356,598	6,952,952	10.0	4.0	45.0	43.8	Yes

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NORD2000 - Main Result

Calculation: 2020_04_Haramsfjellet 8x V136 HH 82 m TA1

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Noise sensitive area						Demands	Sound level	Demands fulfilled?
No.	Name	X(East)	Y(North)	Z	Imission height	Noise	From WTGs	Noise
				[m]	[m]	[dB(A)]	[dB(A)]	[dB(A)]
S	Day						37.4	
S	Evening						37.4	
S	Night						37.4	
T	Noise sensitive point: Demands defined in calculation setup. (752)	357,384	6,949,967	11.1	4.0	45.0	21.3	Yes
T	Day						15.0	
T	Evening						15.0	
T	Night						15.0	
U	Noise sensitive point: Demands defined in calculation setup. (753)	357,343	6,949,843	9.6	4.0	45.0	27.7	Yes
U	Day						21.4	
U	Evening						21.4	
U	Night						21.4	
V	Noise sensitive point: Demands defined in calculation setup. (754)	357,500	6,949,860	10.9	4.0	45.0	27.4	Yes
V	Day						21.0	
V	Evening						21.0	
V	Night						21.0	
W	Noise sensitive point: Demands defined in calculation setup. (755)	356,687	6,952,944	10.4	4.0	45.0	44.0	Yes
W	Day						37.6	
W	Evening						37.6	
W	Night						37.6	
X	Noise sensitive point: Demands defined in calculation setup. (756)	356,317	6,953,050	1.9	4.0	45.0	39.1	Yes
X	Day						32.7	
X	Evening						32.7	
X	Night						32.7	
Y	Noise sensitive point: Demands defined in calculation setup. (757)	356,214	6,950,257	5.8	4.0	45.0	41.0	Yes
Y	Day						34.6	
Y	Evening						34.6	
Y	Night						34.6	
Z	Noise sensitive point: Demands defined in calculation setup. (758)	357,507	6,950,041	16.1	4.0	45.0	19.3	Yes
Z	Day						12.9	
Z	Evening						12.9	
Z	Night						12.9	
AA	Noise sensitive point: Demands defined in calculation setup. (759)	356,944	6,950,208	14.8	4.0	45.0	21.2	Yes
AA	Day						14.8	
AA	Evening						14.8	
AA	Night						14.8	
AB	Noise sensitive point: Demands defined in calculation setup. (760)	356,431	6,950,353	15.0	4.0	45.0	32.2	Yes
AB	Day						25.8	
AB	Evening						25.8	
AB	Night						25.8	
AC	Noise sensitive point: Demands defined in calculation setup. (761)	355,814	6,950,526	12.0	4.0	45.0	44.1	Yes
AC	Day						37.7	
AC	Evening						37.7	
AC	Night						37.7	
AD	Noise sensitive point: Demands defined in calculation setup. (762)	356,348	6,950,278	10.0	4.0	45.0	37.5	Yes
AD	Day						31.1	
AD	Evening						31.1	
AD	Night						31.1	
AE	Noise sensitive point: Demands defined in calculation setup. (763)	356,648	6,952,960	13.1	4.0	45.0	43.7	Yes
AE	Day						37.3	
AE	Evening						37.3	
AE	Night						37.3	
AF	Noise sensitive point: Demands defined in calculation setup. (764)	356,516	6,952,929	15.0	4.0	45.0	43.0	Yes
AF	Day						36.6	
AF	Evening						36.6	
AF	Night						36.6	
AG	Noise sensitive point: Demands defined in calculation setup. (765)	356,135	6,950,453	15.0	4.0	45.0	24.6	Yes
AG	Day						18.2	
AG	Evening						18.2	
AG	Night						18.2	
AH	Noise sensitive point: Demands defined in calculation setup. (766)	357,070	6,950,192	15.2	4.0	45.0	20.9	Yes
AH	Day						14.5	
AH	Evening						14.5	
AH	Night						14.5	
AI	Noise sensitive point: Demands defined in calculation setup. (767)	357,282	6,950,054	12.0	4.0	45.0	20.1	Yes
AI	Day						13.7	
AI	Evening						13.7	
AI	Night						13.7	

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NORD2000 - Main Result

Calculation: 2020_04_Haramsfjellet 8x V136 HH 82 m TA1

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Noise sensitive area						Demands	Sound level	Demands fulfilled?
No.	Name	X(East)	Y(North)	Z	Imission height	Noise	From WTGs	Noise
				[m]	[m]	[dB(A)]	[dB(A)]	[dB(A)]
AJ	Noise sensitive point: Demands defined in calculation setup. (768)	356,114	6,950,453	14.3	4.0	45.0	27.0	Yes
AJ	Day						20.6	
AJ	Evening						20.6	
AJ	Night						20.6	
AK	Noise sensitive point: Demands defined in calculation setup. (769)	356,715	6,950,269	15.8	4.0	45.0	22.1	Yes
AK	Day						15.7	
AK	Evening						15.7	
AK	Night						15.7	
AL	Noise sensitive point: Demands defined in calculation setup. (770)	356,115	6,950,290	5.7	4.0	45.0	42.0	Yes
AL	Day						35.6	
AL	Evening						35.6	
AL	Night						35.6	
AM	Noise sensitive point: Demands defined in calculation setup. (771)	356,289	6,952,926	9.6	4.0	45.0	39.2	Yes
AM	Day						32.8	
AM	Evening						32.8	
AM	Night						32.8	
AN	Noise sensitive point: Demands defined in calculation setup. (772)	355,668	6,950,529	13.4	4.0	45.0	43.7	Yes
AN	Day						37.3	
AN	Evening						37.3	
AN	Night						37.3	
AO	Noise sensitive point: Demands defined in calculation setup. (773)	356,051	6,953,030	5.0	4.0	45.0	43.2	Yes
AO	Day						36.8	
AO	Evening						36.8	
AO	Night						36.8	
AP	Noise sensitive point: Demands defined in calculation setup. (774)	356,465	6,950,343	15.0	4.0	45.0	27.5	Yes
AP	Day						21.1	
AP	Evening						21.1	
AP	Night						21.1	
AQ	Noise sensitive point: Demands defined in calculation setup. (775)	356,253	6,952,942	8.3	4.0	45.0	39.2	Yes
AQ	Day						32.8	
AQ	Evening						32.8	
AQ	Night						32.8	
AR	Noise sensitive point: Demands defined in calculation setup. (776)	356,469	6,952,988	3.5	4.0	45.0	43.4	Yes
AR	Day						37.0	
AR	Evening						37.0	
AR	Night						37.0	
AS	Noise sensitive point: Demands defined in calculation setup. (777)	356,478	6,952,987	3.7	4.0	45.0	43.3	Yes
AS	Day						36.9	
AS	Evening						36.9	
AS	Night						36.9	
AT	Noise sensitive point: Demands defined in calculation setup. (778)	356,159	6,952,982	6.6	4.0	45.0	41.5	Yes
AT	Day						35.1	
AT	Evening						35.1	
AT	Night						35.1	
AU	Noise sensitive point: Demands defined in calculation setup. (779)	356,602	6,950,288	15.0	4.0	45.0	22.0	Yes
AU	Day						15.6	
AU	Evening						15.6	
AU	Night						15.6	
AV	Noise sensitive point: Demands defined in calculation setup. (780)	357,454	6,950,166	18.8	4.0	45.0	18.7	Yes
AV	Day						12.3	
AV	Evening						12.3	
AV	Night						12.3	
AW	Noise sensitive point: Demands defined in calculation setup. (781)	355,877	6,950,490	11.6	4.0	45.0	44.0	Yes
AW	Day						37.6	
AW	Evening						37.6	
AW	Night						37.6	
AX	Noise sensitive point: Demands defined in calculation setup. (782)	356,095	6,953,023	5.3	4.0	45.0	43.6	Yes
AX	Day						37.2	
AX	Evening						37.2	
AX	Night						37.2	
AY	Noise sensitive point: Demands defined in calculation setup. (783)	355,345	6,950,425	8.3	4.0	45.0	42.1	Yes
AY	Day						35.7	
AY	Evening						35.7	
AY	Night						35.7	
AZ	Noise sensitive point: Demands defined in calculation setup. (784)	356,476	6,950,266	11.3	4.0	45.0	34.3	Yes
AZ	Day						27.9	
AZ	Evening						27.9	

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NORD2000 - Main Result

Calculation: 2020_04_Haramsfjellet 8x V136 HH 82 m TA1

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No.	Noise sensitive area Name	X(East)	Y(North)	Z [m]	Imission height [m]	Demands Noise [dB(A)]	Sound level From WTGs [dB(A)]	Demands fulfilled? Noise [dB(A)]
AZ	Night						27.9	
BA	Noise sensitive point: Demands defined in calculation setup. (785)	356,863	6,950,240	15.1	4.0	45.0	21.5	Yes
BA	Day						15.1	
BA	Evening						15.1	
BA	Night						15.1	
BB	Noise sensitive point: Demands defined in calculation setup. (786)	355,782	6,950,531	10.1	4.0	45.0	44.1	Yes
BB	Day						37.7	
BB	Evening						37.7	
BB	Night						37.7	
BC	Noise sensitive point: Demands defined in calculation setup. (787)	356,794	6,950,258	15.6	4.0	45.0	21.2	Yes
BC	Day						14.8	
BC	Evening						14.8	
BC	Night						14.8	
BD	Noise sensitive point: Demands defined in calculation setup. (788)	355,547	6,950,425	8.6	4.0	45.0	43.2	Yes
BD	Day						36.9	
BD	Evening						36.9	
BD	Night						36.9	
BE	Noise sensitive point: Demands defined in calculation setup. (789)	356,073	6,950,329	6.2	4.0	45.0	42.5	Yes
BE	Day						36.1	
BE	Evening						36.1	
BE	Night						36.1	
BF	Noise sensitive point: Demands defined in calculation setup. (846)	356,264	6,953,051	3.1	4.0	45.0	39.8	Yes
BF	Day						33.4	
BF	Evening						33.4	
BF	Night						33.4	
BG	Noise sensitive point: Demands defined in calculation setup. (847)	356,337	6,950,438	20.0	4.0	45.0	36.8	Yes
BG	Day						30.4	
BG	Evening						30.4	
BG	Night						30.4	
BH	Noise sensitive point: Demands defined in calculation setup. (848)	355,363	6,953,382	13.3	4.0	45.0	41.4	Yes
BH	Day						35.0	
BH	Evening						35.0	
BH	Night						35.0	
BI	Noise sensitive point: Demands defined in calculation setup. (849)	356,256	6,953,071	2.4	4.0	45.0	40.9	Yes
BI	Day						34.5	
BI	Evening						34.5	
BI	Night						34.5	
BJ	Noise sensitive point: Demands defined in calculation setup. (850)	356,626	6,952,977	8.4	4.0	45.0	43.7	Yes
BJ	Day						37.3	
BJ	Evening						37.3	
BJ	Night						37.3	
BK	Noise sensitive point: Demands defined in calculation setup. (851)	357,083	6,952,151	9.2	4.0	45.0	46.9	No
BK	Day						40.5	
BK	Evening						40.5	
BK	Night						40.5	
BL	Noise sensitive point: Demands defined in calculation setup. (852)	356,730	6,952,960	5.2	4.0	45.0	43.5	Yes
BL	Day						37.1	
BL	Evening						37.1	
BL	Night						37.1	
BM	Noise sensitive point: Demands defined in calculation setup. (853)	356,709	6,952,932	6.5	4.0	45.0	44.3	Yes
BM	Day						37.9	
BM	Evening						37.9	
BM	Night						37.9	
BN	Noise sensitive point: Demands defined in calculation setup. (854)	356,024	6,950,273	1.9	4.0	45.0	42.6	Yes
BN	Day						36.2	
BN	Evening						36.2	
BN	Night						36.2	
BO	Noise sensitive point: Demands defined in calculation setup. (855)	356,713	6,952,953	8.5	4.0	45.0	44.0	Yes
BO	Day						37.6	
BO	Evening						37.6	
BO	Night						37.6	
BP	Noise sensitive point: Demands defined in calculation setup. (856)	356,717	6,952,961	8.4	4.0	45.0	43.8	Yes
BP	Day						37.4	
BP	Evening						37.4	
BP	Night						37.4	
BQ	Noise sensitive point: Demands defined in calculation setup. (857)	356,632	6,952,931	10.0	4.0	45.0	44.0	Yes
BQ	Day						37.6	

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NORD2000 - Main Result

Calculation: 2020_04_Haramsfjellet 8x V136 HH 82 m TA1

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Noise sensitive area						Demands	Sound level	Demands fulfilled?
No.	Name	X(East)	Y(North)	Z	Imission height	Noise	From WTGs	Noise
				[m]	[m]	[dB(A)]	[dB(A)]	[dB(A)]
BQ	Evening						37.6	
BQ	Night						37.6	
BR	Noise sensitive point: Demands defined in calculation setup. (858)	356,646	6,952,988	5.5	4.0	45.0	43.4	Yes
BR	Day						37.0	
BR	Evening						37.0	
BR	Night						37.0	
BS	Noise sensitive point: Demands defined in calculation setup. (859)	356,551	6,952,929	15.0	4.0	45.0	43.7	Yes
BS	Day						37.3	
BS	Evening						37.3	
BS	Night						37.3	
BT	Noise sensitive point: Demands defined in calculation setup. (860)	355,874	6,950,349	4.3	4.0	45.0	43.5	Yes
BT	Day						37.1	
BT	Evening						37.1	
BT	Night						37.1	
BU	Noise sensitive point: Demands defined in calculation setup. (861)	355,863	6,953,093	9.1	4.0	45.0	43.7	Yes
BU	Day						37.3	
BU	Evening						37.3	
BU	Night						37.3	
BV	Noise sensitive point: Demands defined in calculation setup. (862)	356,580	6,952,934	12.2	4.0	45.0	43.6	Yes
BV	Day						37.2	
BV	Evening						37.2	
BV	Night						37.2	
BW	Noise sensitive point: Demands defined in calculation setup. (863)	356,567	6,952,961	10.9	4.0	45.0	44.2	Yes
BW	Day						37.8	
BW	Evening						37.8	
BW	Night						37.8	
BX	Noise sensitive point: Demands defined in calculation setup. (864)	356,642	6,952,940	11.3	4.0	45.0	43.9	Yes
BX	Day						37.5	
BX	Evening						37.5	
BX	Night						37.5	
BY	Noise sensitive point: Demands defined in calculation setup. (865)	356,671	6,952,938	12.1	4.0	45.0	44.0	Yes
BY	Day						37.6	
BY	Evening						37.6	
BY	Night						37.6	
BZ	Noise sensitive point: Demands defined in calculation setup. (866)	355,030	6,953,694	3.6	4.0	45.0	39.5	Yes
BZ	Day						33.1	
BZ	Evening						33.1	
BZ	Night						33.1	
CA	Noise sensitive point: Demands defined in calculation setup. (867)	356,228	6,953,055	3.8	4.0	45.0	40.9	Yes
CA	Day						34.5	
CA	Evening						34.5	
CA	Night						34.5	
CB	Noise sensitive point: Demands defined in calculation setup. (868)	356,711	6,952,980	7.8	4.0	45.0	43.7	Yes
CB	Day						37.3	
CB	Evening						37.3	
CB	Night						37.3	
CC	Noise sensitive point: Demands defined in calculation setup. (869)	355,834	6,950,356	4.6	4.0	45.0	43.2	Yes
CC	Day						36.8	
CC	Evening						36.8	
CC	Night						36.8	
CD	Noise sensitive point: Demands defined in calculation setup. (870)	356,670	6,952,989	10.1	4.0	45.0	44.6	Yes
CD	Day						38.2	
CD	Evening						38.2	
CD	Night						38.2	
CE	Noise sensitive point: Demands defined in calculation setup. (871)	355,629	6,950,575	10.6	4.0	45.0	44.1	Yes
CE	Day						37.7	
CE	Evening						37.7	
CE	Night						37.7	
CF	Noise sensitive point: Demands defined in calculation setup. (872)	356,679	6,952,912	6.0	4.0	45.0	43.7	Yes
CF	Day						37.3	
CF	Evening						37.3	
CF	Night						37.3	
CG	Noise sensitive point: Demands defined in calculation setup. (873)	356,687	6,952,928	8.3	4.0	45.0	44.1	Yes
CG	Day						37.7	
CG	Evening						37.7	
CG	Night						37.7	
CH	Noise sensitive point: Norwegian - Yellow zone (908)	356,776	6,952,506	13.5	4.0	45.0	43.1	Yes

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NORD2000 - Main Result

Calculation: 2020_04_Haramsfjellet 8x V136 HH 82 m TA1

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Noise sensitive area						Demands	Sound level	Demands fulfilled?
No.	Name	X(East)	Y(North)	Z	Imission height	Noise	From WTGs	Noise
				[m]	[m]	[dB(A)]	[dB(A)]	[dB(A)]
CH	Day						36.7	
CH	Evening						36.7	
CH	Night						36.7	
CI	Noise sensitive point: Norwegian - Yellow zone (909)	356,793	6,952,513	12.6	4.0	45.0	42.4	Yes
CI	Day						36.0	
CI	Evening						36.0	
CI	Night						36.0	
CJ	Noise sensitive point: Norwegian - Yellow zone (910)	356,813	6,952,516	11.6	4.0	45.0	43.9	Yes
CJ	Day						37.5	
CJ	Evening						37.5	
CJ	Night						37.5	
CK	Noise sensitive point: Norwegian - Yellow zone (911)	356,821	6,952,464	15.9	4.0	45.0	42.6	Yes
CK	Day						36.2	
CK	Evening						36.2	
CK	Night						36.2	
CL	Noise sensitive point: Norwegian - Yellow zone (912)	356,836	6,952,449	15.0	4.0	45.0	44.1	Yes
CL	Day						37.7	
CL	Evening						37.7	
CL	Night						37.7	
CM	Noise sensitive point: Norwegian - Yellow zone (913)	356,856	6,952,444	11.4	4.0	45.0	44.5	Yes
CM	Day						38.1	
CM	Evening						38.1	
CM	Night						38.1	
CN	Noise sensitive point: Norwegian - Yellow zone (914)	356,864	6,952,464	10.0	4.0	45.0	45.0	Yes
CN	Day						38.6	
CN	Evening						38.6	
CN	Night						38.6	
CO	Noise sensitive point: Norwegian - Yellow zone (915)	356,872	6,952,482	9.7	4.0	45.0	46.2	No
CO	Day						39.8	
CO	Evening						39.8	
CO	Night						39.8	
CP	Noise sensitive point: Norwegian - Yellow zone (916)	356,868	6,952,409	11.6	4.0	45.0	44.8	Yes
CP	Day						38.4	
CP	Evening						38.4	
CP	Night						38.4	
CQ	Noise sensitive point: Norwegian - Yellow zone (917)	356,887	6,952,429	9.1	4.0	45.0	45.0	Yes
CQ	Day						38.6	
CQ	Evening						38.6	
CQ	Night						38.6	
CR	Noise sensitive point: Norwegian - Yellow zone (918)	356,898	6,952,463	6.6	4.0	45.0	45.5	No
CR	Day						39.1	
CR	Evening						39.1	
CR	Night						39.1	
CS	Noise sensitive point: Norwegian - Yellow zone (919)	356,905	6,952,444	6.5	4.0	45.0	44.7	Yes
CS	Day						38.3	
CS	Evening						38.3	
CS	Night						38.3	
CT	Noise sensitive point: Norwegian - Yellow zone (920)	356,893	6,952,412	9.4	4.0	45.0	45.2	No
CT	Day						38.8	
CT	Evening						38.8	
CT	Night						38.8	
CU	Noise sensitive point: Norwegian - Yellow zone (921)	356,915	6,952,425	7.1	4.0	45.0	45.3	No
CU	Day						38.9	
CU	Evening						38.9	
CU	Night						38.9	
CV	Noise sensitive point: Norwegian - Yellow zone (922)	356,901	6,952,391	9.5	4.0	45.0	45.1	No
CV	Day						38.7	
CV	Evening						38.7	
CV	Night						38.7	
CW	Noise sensitive point: Norwegian - Yellow zone (923)	356,921	6,952,404	7.4	4.0	45.0	45.4	No
CW	Day						39.0	
CW	Evening						39.0	
CW	Night						39.0	

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NORD2000 - Main Result

Calculation: 2020_04_Haramsfjellet 8x V136 HH 82 m TA1

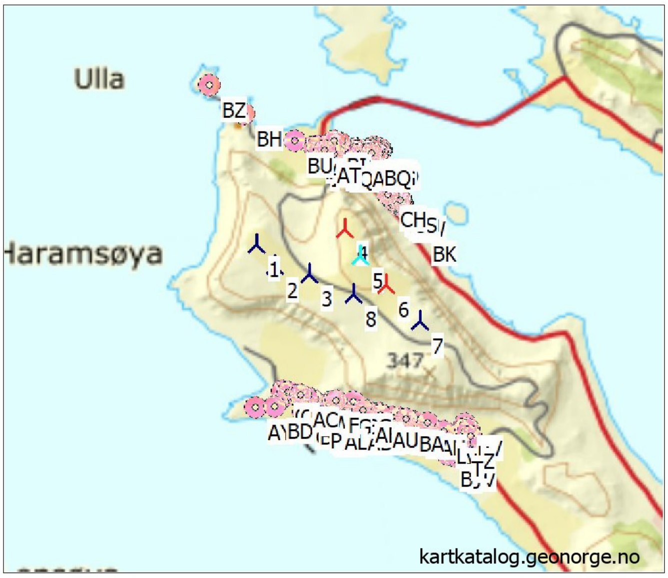
NORD2000 - Main Result

Calculation: 2020_04_Haramsfjellet 8 x V136 HH 82 m TA1, Alternative - SO1 for T04, T06, SO2 for T05, MAP

Assumptions

Weather stability	
Relative humidity	70.0 %
Air temperature	10.0 °C
Height for air temperature	2.0 m
Stability parameters	Night;Clear sky
Inverse Monin Obukhov length	0.0100
Temperature scale T*	0.0500
Terrain	
Elevation based on object	
Height Contours: Haram_Height.map (2)	
Roughness based on line object	
Roughness Lines: HaramRoughness(3).map (7)	
Terrain type based on area object	
Area object (): REGIONS_2019_05_HaramFjellet_1.w2r (2)	
Month for calculation	January
Wind speed criteria	
Uniform wind speed at 10 m agl.	
Wind speed	Max noise wind speed
Max noise wind speed	All receptors downwind
Wind direction	4.0 m
Height above ground level for receiver	
Wind speed has been extrapolated to calculation height using	
IEC profile shear (z0 = 0.05m)	
No stability correction	6.004
Version	

All coordinates are in
UTM WGS84 Zone: 32



Scale 1:75,000

New WTG   Noise sensitive area

WTGs

	X(East)	Y(North)	Z	Row data/Description	WTG type Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Setting	Noise data Creator	Name
			[m]					[kW]	[m]	[m]			
1	355,427	6,952,069	270.0	VESTAS V136-4.2 420...	Yes	VESTAS	V136-4.2-4,200	4,200	136.0	82.0	Day	USER	Haramsfjellet_2019_03
											Evening	USER	Haramsfjellet_2019_03
											Night	USER	Haramsfjellet_2019_03
2	355,607	6,951,847	253.5	VESTAS V136-4.2 420...	Yes	VESTAS	V136-4.2-4,200	4,200	136.0	82.0	Day	USER	Haramsfjellet_2019_03
											Evening	USER	Haramsfjellet_2019_03
											Night	USER	Haramsfjellet_2019_03
3	355,946	6,951,739	248.5	VESTAS V136-4.2 420...	Yes	VESTAS	V136-4.2-4,200	4,200	136.0	82.0	Day	USER	Haramsfjellet_2019_03
											Evening	USER	Haramsfjellet_2019_03
											Night	USER	Haramsfjellet_2019_03
4	356,327	6,952,184	326.0	VESTAS V136-4.2 420...	Yes	VESTAS	V136-4.2-4,200	4,200	136.0	82.0	Day	USER	Sound Optimized Mode SO1
											Evening	USER	Sound Optimized Mode SO1
											Night	USER	Sound Optimized Mode SO1
5	356,469	6,951,907	330.0	VESTAS V136-4.2 420...	Yes	VESTAS	V136-4.2-4,200	4,200	136.0	82.0	Day	USER	Sound Opitmized Mode SO2
											Evening	USER	Sound Opitmized Mode SO2
											Night	USER	Sound Opitmized Mode SO2
6	356,717	6,951,604	292.3	VESTAS V136-4.2 420...	Yes	VESTAS	V136-4.2-4,200	4,200	136.0	82.0	Day	USER	Sound Optimized Mode SO1
											Evening	USER	Sound Optimized Mode SO1
											Night	USER	Sound Optimized Mode SO1
7	357,038	6,951,221	310.0	VESTAS V136-4.2 420...	Yes	VESTAS	V136-4.2-4,200	4,200	136.0	82.0	Day	USER	Haramsfjellet_2019_03
											Evening	USER	Haramsfjellet_2019_03
											Night	USER	Haramsfjellet_2019_03
8	356,383	6,951,518	286.2	VESTAS V136-4.2 420...	Yes	VESTAS	V136-4.2-4,200	4,200	136.0	82.0	Day	USER	Haramsfjellet_2019_03
											Evening	USER	Haramsfjellet_2019_03
											Night	USER	Haramsfjellet_2019_03

Calculation Results

Sound level

Noise sensitive area No.	Name	X(East)	Y(North)	Z	Imission height	Demands Noise	Sound level From WTGs	Demands fulfilled? Noise
				[m]	[m]	[dB(A)]	[dB(A)]	[dB(A)]
A	Noise sensitive point: Demands defined in calculation setup. (733)	357,490	6,950,111	17.4	4.0	45.0	18.3	Yes
A	Day						11.9	
A	Evening						11.9	
A	Night						11.9	
B	Noise sensitive point: Demands defined in calculation setup. (734)	357,263	6,949,868	5.7	4.0	45.0	26.9	Yes
B	Day						20.5	
B	Evening						20.5	

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NORD2000 - Main Result

Calculation: 2020_04_Haramsfjellet 8 x V136 HH 82 m TA1, Alternative - SO1 for T04, T06, SO2 for T05, MAP

...continued from previous page

Noise sensitive area						**Demands**	**Sound level**	**Demands fulfilled?**
No.	Name	X(East)	Y(North)	Z	Imission height	Noise	From WTGs	Noise
				[m]	[m]	[dB(A)]	[dB(A)]	[dB(A)]
B	Night						20.5	
C	Noise sensitive point: Demands defined in calculation setup. (735)	355,912	6,950,483	11.7	4.0	45.0	43.6	Yes
C	Day						37.2	
C	Evening						37.2	
C	Night						37.2	
D	Noise sensitive point: Demands defined in calculation setup. (736)	356,455	6,952,956	7.7	4.0	45.0	42.0	Yes
D	Day						35.6	
D	Evening						35.6	
D	Night						35.6	
E	Noise sensitive point: Demands defined in calculation setup. (737)	356,503	6,952,972	6.4	4.0	45.0	41.4	Yes
E	Day						35.1	
E	Evening						35.1	
E	Night						35.1	
F	Noise sensitive point: Demands defined in calculation setup. (738)	356,167	6,950,459	16.7	4.0	45.0	33.5	Yes
F	Day						27.1	
F	Evening						27.1	
F	Night						27.1	
G	Noise sensitive point: Demands defined in calculation setup. (739)	356,540	6,952,961	10.0	4.0	45.0	41.7	Yes
G	Day						35.3	
G	Evening						35.3	
G	Night						35.3	
H	Noise sensitive point: Demands defined in calculation setup. (740)	356,488	6,952,946	10.5	4.0	45.0	42.2	Yes
H	Day						35.8	
H	Evening						35.8	
H	Night						35.8	
I	Noise sensitive point: Demands defined in calculation setup. (741)	356,104	6,952,943	9.8	4.0	45.0	42.9	Yes
I	Day						36.5	
I	Evening						36.5	
I	Night						36.5	
J	Noise sensitive point: Demands defined in calculation setup. (742)	357,295	6,949,890	6.8	4.0	45.0	23.5	Yes
J	Day						17.1	
J	Evening						17.1	
J	Night						17.1	
K	Noise sensitive point: Demands defined in calculation setup. (743)	356,599	6,950,309	16.3	4.0	45.0	21.2	Yes
K	Day						14.8	
K	Evening						14.8	
K	Night						14.8	
L	Noise sensitive point: Demands defined in calculation setup. (744)	357,235	6,950,105	12.7	4.0	45.0	18.8	Yes
L	Day						12.4	
L	Evening						12.4	
L	Night						12.4	
M	Noise sensitive point: Demands defined in calculation setup. (745)	355,937	6,950,470	11.1	4.0	45.0	43.8	Yes
M	Day						37.4	
M	Evening						37.4	
M	Night						37.4	
N	Noise sensitive point: Demands defined in calculation setup. (746)	357,418	6,949,949	11.5	4.0	45.0	21.4	Yes
N	Day						15.0	
N	Evening						15.0	
N	Night						15.0	
O	Noise sensitive point: Demands defined in calculation setup. (747)	356,007	6,950,290	2.4	4.0	45.0	42.2	Yes
O	Day						35.8	
O	Evening						35.8	
O	Night						35.8	
P	Noise sensitive point: Demands defined in calculation setup. (748)	355,974	6,950,315	2.8	4.0	45.0	42.4	Yes
P	Day						36.0	
P	Evening						36.0	
P	Night						36.0	
Q	Noise sensitive point: Demands defined in calculation setup. (749)	355,685	6,950,564	15.0	4.0	45.0	43.3	Yes
Q	Day						36.9	
Q	Evening						36.9	
Q	Night						36.9	
R	Noise sensitive point: Demands defined in calculation setup. (750)	357,452	6,950,125	17.0	4.0	45.0	19.8	Yes
R	Day						13.4	
R	Evening						13.4	
R	Night						13.4	
S	Noise sensitive point: Demands defined in calculation setup. (751)	356,598	6,952,952	10.0	4.0	45.0	42.1	Yes
S	Day						35.7	

To be continued on next page...

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Calculated:
2020-05-08 03:39/3.3.274

NORD2000 - Main Result

Calculation: 2020_04_Haramsfjellet 8 x V136 HH 82 m TA1, Alternative - SO1 for T04, T06, SO2 for T05, MAP

...continued from previous page

Noise sensitive area						Demands	Sound level	Demands fulfilled?
No.	Name	X(East)	Y(North)	Z	Imission height	Noise	From WTGs	Noise
				[m]	[m]	[dB(A)]	[dB(A)]	[dB(A)]
S	Evening						35.7	
S	Night						35.7	
T	Noise sensitive point: Demands defined in calculation setup. (752)	357,384	6,949,967	11.1	4.0	45.0	20.9	Yes
T	Day						14.5	
T	Evening						14.5	
T	Night						14.5	
U	Noise sensitive point: Demands defined in calculation setup. (753)	357,343	6,949,843	9.6	4.0	45.0	27.7	Yes
U	Day						21.3	
U	Evening						21.3	
U	Night						21.3	
V	Noise sensitive point: Demands defined in calculation setup. (754)	357,500	6,949,860	10.9	4.0	45.0	27.3	Yes
V	Day						20.9	
V	Evening						20.9	
V	Night						20.9	
W	Noise sensitive point: Demands defined in calculation setup. (755)	356,687	6,952,944	10.4	4.0	45.0	42.3	Yes
W	Day						35.9	
W	Evening						35.9	
W	Night						35.9	
X	Noise sensitive point: Demands defined in calculation setup. (756)	356,317	6,953,050	1.9	4.0	45.0	39.0	Yes
X	Day						32.6	
X	Evening						32.6	
X	Night						32.6	
Y	Noise sensitive point: Demands defined in calculation setup. (757)	356,214	6,950,257	5.8	4.0	45.0	40.3	Yes
Y	Day						33.9	
Y	Evening						33.9	
Y	Night						33.9	
Z	Noise sensitive point: Demands defined in calculation setup. (758)	357,507	6,950,041	16.1	4.0	45.0	18.6	Yes
Z	Day						12.2	
Z	Evening						12.2	
Z	Night						12.2	
AA	Noise sensitive point: Demands defined in calculation setup. (759)	356,944	6,950,208	14.8	4.0	45.0	20.4	Yes
AA	Day						14.0	
AA	Evening						14.0	
AA	Night						14.0	
AB	Noise sensitive point: Demands defined in calculation setup. (760)	356,431	6,950,353	15.0	4.0	45.0	32.2	Yes
AB	Day						25.8	
AB	Evening						25.8	
AB	Night						25.8	
AC	Noise sensitive point: Demands defined in calculation setup. (761)	355,814	6,950,526	12.0	4.0	45.0	43.5	Yes
AC	Day						37.1	
AC	Evening						37.1	
AC	Night						37.1	
AD	Noise sensitive point: Demands defined in calculation setup. (762)	356,348	6,950,278	10.0	4.0	45.0	37.5	Yes
AD	Day						31.1	
AD	Evening						31.1	
AD	Night						31.1	
AE	Noise sensitive point: Demands defined in calculation setup. (763)	356,648	6,952,960	13.1	4.0	45.0	41.9	Yes
AE	Day						35.5	
AE	Evening						35.5	
AE	Night						35.5	
AF	Noise sensitive point: Demands defined in calculation setup. (764)	356,516	6,952,929	15.0	4.0	45.0	41.7	Yes
AF	Day						35.3	
AF	Evening						35.3	
AF	Night						35.3	
AG	Noise sensitive point: Demands defined in calculation setup. (765)	356,135	6,950,453	15.0	4.0	45.0	23.8	Yes
AG	Day						17.4	
AG	Evening						17.4	
AG	Night						17.4	
AH	Noise sensitive point: Demands defined in calculation setup. (766)	357,070	6,950,192	15.2	4.0	45.0	20.1	Yes
AH	Day						13.7	
AH	Evening						13.7	
AH	Night						13.7	
AI	Noise sensitive point: Demands defined in calculation setup. (767)	357,282	6,950,054	12.0	4.0	45.0	19.5	Yes
AI	Day						13.1	
AI	Evening						13.1	
AI	Night						13.1	
AJ	Noise sensitive point: Demands defined in calculation setup. (768)	356,114	6,950,453	14.3	4.0	45.0	26.7	Yes

To be continued on next page...

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2020-05-08 03:39/3.3.274

NORD2000 - Main Result

Calculation: 2020_04_Haramsfjellet 8 x V136 HH 82 m TA1, Alternative - SO1 for T04, T06, SO2 for T05, MAP

...continued from previous page

Noise sensitive area						**Demands**	**Sound level**	**Demands fulfilled?**
No.	Name	X(East)	Y(North)	Z	Imission height	Noise	From WTGs	Noise
				[m]	[m]	[dB(A)]	[dB(A)]	[dB(A)]
AJ	Day						20.3	
AJ	Evening						20.3	
AJ	Night						20.3	
AK	Noise sensitive point: Demands defined in calculation setup. (769)	356,715	6,950,269	15.8	4.0	45.0	21.3	Yes
AK	Day						14.9	
AK	Evening						14.9	
AK	Night						14.9	
AL	Noise sensitive point: Demands defined in calculation setup. (770)	356,115	6,950,290	5.7	4.0	45.0	41.2	Yes
AL	Day						34.8	
AL	Evening						34.8	
AL	Night						34.8	
AM	Noise sensitive point: Demands defined in calculation setup. (771)	356,289	6,952,926	9.6	4.0	45.0	39.1	Yes
AM	Day						32.7	
AM	Evening						32.7	
AM	Night						32.7	
AN	Noise sensitive point: Demands defined in calculation setup. (772)	355,668	6,950,529	13.4	4.0	45.0	43.2	Yes
AN	Day						36.8	
AN	Evening						36.8	
AN	Night						36.8	
AO	Noise sensitive point: Demands defined in calculation setup. (773)	356,051	6,953,030	5.0	4.0	45.0	42.5	Yes
AO	Day						36.1	
AO	Evening						36.1	
AO	Night						36.1	
AP	Noise sensitive point: Demands defined in calculation setup. (774)	356,465	6,950,343	15.0	4.0	45.0	27.4	Yes
AP	Day						21.0	
AP	Evening						21.0	
AP	Night						21.0	
AQ	Noise sensitive point: Demands defined in calculation setup. (775)	356,253	6,952,942	8.3	4.0	45.0	39.2	Yes
AQ	Day						32.8	
AQ	Evening						32.8	
AQ	Night						32.8	
AR	Noise sensitive point: Demands defined in calculation setup. (776)	356,469	6,952,988	3.5	4.0	45.0	42.4	Yes
AR	Day						36.0	
AR	Evening						36.0	
AR	Night						36.0	
AS	Noise sensitive point: Demands defined in calculation setup. (777)	356,478	6,952,987	3.7	4.0	45.0	42.2	Yes
AS	Day						35.8	
AS	Evening						35.8	
AS	Night						35.8	
AT	Noise sensitive point: Demands defined in calculation setup. (778)	356,159	6,952,982	6.6	4.0	45.0	41.4	Yes
AT	Day						35.0	
AT	Evening						35.0	
AT	Night						35.0	
AU	Noise sensitive point: Demands defined in calculation setup. (779)	356,602	6,950,288	15.0	4.0	45.0	21.1	Yes
AU	Day						14.7	
AU	Evening						14.7	
AU	Night						14.7	
AV	Noise sensitive point: Demands defined in calculation setup. (780)	357,454	6,950,166	18.8	4.0	45.0	18.4	Yes
AV	Day						12.0	
AV	Evening						12.0	
AV	Night						12.0	
AW	Noise sensitive point: Demands defined in calculation setup. (781)	355,877	6,950,490	11.6	4.0	45.0	43.4	Yes
AW	Day						37.0	
AW	Evening						37.0	
AW	Night						37.0	
AX	Noise sensitive point: Demands defined in calculation setup. (782)	356,095	6,953,023	5.3	4.0	45.0	43.0	Yes
AX	Day						36.6	
AX	Evening						36.6	
AX	Night						36.6	
AY	Noise sensitive point: Demands defined in calculation setup. (783)	355,345	6,950,425	8.3	4.0	45.0	41.5	Yes
AY	Day						35.1	
AY	Evening						35.1	
AY	Night						35.1	
AZ	Noise sensitive point: Demands defined in calculation setup. (784)	356,476	6,950,266	11.3	4.0	45.0	34.3	Yes
AZ	Day						27.9	
AZ	Evening						27.9	
AZ	Night						27.9	

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NORD2000 - Main Result

Calculation: 2020_04_Haramsfjellet 8 x V136 HH 82 m TA1, Alternative - SO1 for T04, T06, SO2 for T05, MAP

...continued from previous page

Noise sensitive area						**Demands**	**Sound level**	**Demands fulfilled?**
No.	Name	X(East)	Y(North)	Z	Imission height	Noise	From WTGs	Noise
				[m]	[m]	[dB(A)]	[dB(A)]	[dB(A)]
BA	Noise sensitive point: Demands defined in calculation setup. (785)	356,863	6,950,240	15.1	4.0	45.0	21.0	Yes
BA	Day						14.6	
BA	Evening						14.6	
BA	Night						14.6	
BB	Noise sensitive point: Demands defined in calculation setup. (786)	355,782	6,950,531	10.1	4.0	45.0	43.6	Yes
BB	Day						37.2	
BB	Evening						37.2	
BB	Night						37.2	
BC	Noise sensitive point: Demands defined in calculation setup. (787)	356,794	6,950,258	15.6	4.0	45.0	20.4	Yes
BC	Day						14.0	
BC	Evening						14.0	
BC	Night						14.0	
BD	Noise sensitive point: Demands defined in calculation setup. (788)	355,547	6,950,425	8.6	4.0	45.0	42.8	Yes
BD	Day						36.4	
BD	Evening						36.4	
BD	Night						36.4	
BE	Noise sensitive point: Demands defined in calculation setup. (789)	356,073	6,950,329	6.2	4.0	45.0	41.8	Yes
BE	Day						35.4	
BE	Evening						35.4	
BE	Night						35.4	
BF	Noise sensitive point: Demands defined in calculation setup. (846)	356,264	6,953,051	3.1	4.0	45.0	39.7	Yes
BF	Day						33.3	
BF	Evening						33.3	
BF	Night						33.3	
BG	Noise sensitive point: Demands defined in calculation setup. (847)	356,337	6,950,438	20.0	4.0	45.0	36.8	Yes
BG	Day						30.4	
BG	Evening						30.4	
BG	Night						30.4	
BH	Noise sensitive point: Demands defined in calculation setup. (848)	355,363	6,953,382	13.3	4.0	45.0	40.7	Yes
BH	Day						34.3	
BH	Evening						34.3	
BH	Night						34.3	
BI	Noise sensitive point: Demands defined in calculation setup. (849)	356,256	6,953,071	2.4	4.0	45.0	40.8	Yes
BI	Day						34.4	
BI	Evening						34.4	
BI	Night						34.4	
BJ	Noise sensitive point: Demands defined in calculation setup. (850)	356,626	6,952,977	8.4	4.0	45.0	42.0	Yes
BJ	Day						35.6	
BJ	Evening						35.6	
BJ	Night						35.6	
BK	Noise sensitive point: Demands defined in calculation setup. (851)	357,083	6,952,151	9.2	4.0	45.0	44.8	Yes
BK	Day						38.4	
BK	Evening						38.4	
BK	Night						38.4	
BL	Noise sensitive point: Demands defined in calculation setup. (852)	356,730	6,952,960	5.2	4.0	45.0	41.7	Yes
BL	Day						35.3	
BL	Evening						35.3	
BL	Night						35.3	
BM	Noise sensitive point: Demands defined in calculation setup. (853)	356,709	6,952,932	6.5	4.0	45.0	42.5	Yes
BM	Day						36.1	
BM	Evening						36.1	
BM	Night						36.1	
BN	Noise sensitive point: Demands defined in calculation setup. (854)	356,024	6,950,273	1.9	4.0	45.0	41.9	Yes
BN	Day						35.5	
BN	Evening						35.5	
BN	Night						35.5	
BO	Noise sensitive point: Demands defined in calculation setup. (855)	356,713	6,952,953	8.5	4.0	45.0	42.3	Yes
BO	Day						35.9	
BO	Evening						35.9	
BO	Night						35.9	
BP	Noise sensitive point: Demands defined in calculation setup. (856)	356,717	6,952,961	8.4	4.0	45.0	42.0	Yes
BP	Day						35.7	
BP	Evening						35.7	
BP	Night						35.7	
BQ	Noise sensitive point: Demands defined in calculation setup. (857)	356,632	6,952,931	10.0	4.0	45.0	42.2	Yes
BQ	Day						35.8	
BQ	Evening						35.8	

To be continued on next page...

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Calculated:
2020-05-08 03:39/3.3.274

NORD2000 - Main Result

Calculation: 2020_04_Haramsfjellet 8 x V136 HH 82 m TA1, Alternative - SO1 for T04, T06, SO2 for T05, MAP

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Noise sensitive area						**Demands**	**Sound level**	**Demands fulfilled?**
No.	Name	X(East)	Y(North)	Z	Imission height	Noise	From WTGs	Noise
				[m]	[m]	[dB(A)]	[dB(A)]	[dB(A)]
BQ	Night						35.8	
BR	Noise sensitive point: Demands defined in calculation setup. (858)	356,646	6,952,988	5.5	4.0	45.0	41.5	Yes
BR	Day						35.1	
BR	Evening						35.1	
BR	Night						35.1	
BS	Noise sensitive point: Demands defined in calculation setup. (859)	356,551	6,952,929	15.0	4.0	45.0	42.4	Yes
BS	Day						36.0	
BS	Evening						36.0	
BS	Night						36.0	
BT	Noise sensitive point: Demands defined in calculation setup. (860)	355,874	6,950,349	4.3	4.0	45.0	43.0	Yes
BT	Day						36.6	
BT	Evening						36.6	
BT	Night						36.6	
BU	Noise sensitive point: Demands defined in calculation setup. (861)	355,863	6,953,093	9.1	4.0	45.0	42.9	Yes
BU	Day						36.5	
BU	Evening						36.5	
BU	Night						36.5	
BV	Noise sensitive point: Demands defined in calculation setup. (862)	356,580	6,952,934	12.2	4.0	45.0	42.0	Yes
BV	Day						35.6	
BV	Evening						35.6	
BV	Night						35.6	
BW	Noise sensitive point: Demands defined in calculation setup. (863)	356,567	6,952,961	10.9	4.0	45.0	42.4	Yes
BW	Day						36.0	
BW	Evening						36.0	
BW	Night						36.0	
BX	Noise sensitive point: Demands defined in calculation setup. (864)	356,642	6,952,940	11.3	4.0	45.0	42.1	Yes
BX	Day						35.7	
BX	Evening						35.7	
BX	Night						35.7	
BY	Noise sensitive point: Demands defined in calculation setup. (865)	356,671	6,952,938	12.1	4.0	45.0	42.3	Yes
BY	Day						35.9	
BY	Evening						35.9	
BY	Night						35.9	
BZ	Noise sensitive point: Demands defined in calculation setup. (866)	355,030	6,953,694	3.6	4.0	45.0	38.7	Yes
BZ	Day						32.3	
BZ	Evening						32.3	
BZ	Night						32.3	
CA	Noise sensitive point: Demands defined in calculation setup. (867)	356,228	6,953,055	3.8	4.0	45.0	40.7	Yes
CA	Day						34.3	
CA	Evening						34.3	
CA	Night						34.3	
CB	Noise sensitive point: Demands defined in calculation setup. (868)	356,711	6,952,980	7.8	4.0	45.0	41.9	Yes
CB	Day						35.5	
CB	Evening						35.5	
CB	Night						35.5	
CC	Noise sensitive point: Demands defined in calculation setup. (869)	355,834	6,950,356	4.6	4.0	45.0	42.6	Yes
CC	Day						36.2	
CC	Evening						36.2	
CC	Night						36.2	
CD	Noise sensitive point: Demands defined in calculation setup. (870)	356,670	6,952,989	10.1	4.0	45.0	42.7	Yes
CD	Day						36.3	
CD	Evening						36.3	
CD	Night						36.3	
CE	Noise sensitive point: Demands defined in calculation setup. (871)	355,629	6,950,575	10.6	4.0	45.0	43.5	Yes
CE	Day						37.1	
CE	Evening						37.1	
CE	Night						37.1	
CF	Noise sensitive point: Demands defined in calculation setup. (872)	356,679	6,952,912	6.0	4.0	45.0	41.6	Yes
CF	Day						35.2	
CF	Evening						35.2	
CF	Night						35.2	
CG	Noise sensitive point: Demands defined in calculation setup. (873)	356,687	6,952,928	8.3	4.0	45.0	42.3	Yes
CG	Day						35.9	
CG	Evening						35.9	
CG	Night						35.9	
CH	Noise sensitive point: Norwegian - Yellow zone (908)	356,776	6,952,506	13.5	4.0	45.0	41.6	Yes
CH	Day						35.2	

To be continued on next page...

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Calculated:
2020-05-08 03:39/3.3.274

NORD2000 - Main Result

Calculation: 2020_04_Haramsfjellet 8 x V136 HH 82 m TA1, Alternative - SO1 for T04, T06, SO2 for T05, MAP

...continued from previous page

Noise sensitive area						Demands	Sound level	Demands fulfilled?
No.	Name	X(East)	Y(North)	Z	Imission height	Noise	From WTGs	Noise
				[m]	[m]	[dB(A)]	[dB(A)]	[dB(A)]
CH	Evening						35.2	
CH	Night						35.2	
CI	Noise sensitive point: Norwegian - Yellow zone (909)	356,793	6,952,513	12.6	4.0	45.0	40.8	Yes
CI	Day						34.4	
CI	Evening						34.4	
CI	Night						34.4	
CJ	Noise sensitive point: Norwegian - Yellow zone (910)	356,813	6,952,516	11.6	4.0	45.0	42.3	Yes
CJ	Day						35.9	
CJ	Evening						35.9	
CJ	Night						35.9	
CK	Noise sensitive point: Norwegian - Yellow zone (911)	356,821	6,952,464	15.9	4.0	45.0	41.0	Yes
CK	Day						34.6	
CK	Evening						34.6	
CK	Night						34.6	
CL	Noise sensitive point: Norwegian - Yellow zone (912)	356,836	6,952,449	15.0	4.0	45.0	42.1	Yes
CL	Day						35.7	
CL	Evening						35.7	
CL	Night						35.7	
CM	Noise sensitive point: Norwegian - Yellow zone (913)	356,856	6,952,444	11.4	4.0	45.0	42.0	Yes
CM	Day						35.6	
CM	Evening						35.6	
CM	Night						35.6	
CN	Noise sensitive point: Norwegian - Yellow zone (914)	356,864	6,952,464	10.0	4.0	45.0	42.6	Yes
CN	Day						36.2	
CN	Evening						36.2	
CN	Night						36.2	
CO	Noise sensitive point: Norwegian - Yellow zone (915)	356,872	6,952,482	9.7	4.0	45.0	44.0	Yes
CO	Day						37.6	
CO	Evening						37.6	
CO	Night						37.6	
CP	Noise sensitive point: Norwegian - Yellow zone (916)	356,868	6,952,409	11.6	4.0	45.0	42.3	Yes
CP	Day						35.9	
CP	Evening						35.9	
CP	Night						35.9	
CQ	Noise sensitive point: Norwegian - Yellow zone (917)	356,887	6,952,429	9.1	4.0	45.0	42.7	Yes
CQ	Day						36.3	
CQ	Evening						36.3	
CQ	Night						36.3	
CR	Noise sensitive point: Norwegian - Yellow zone (918)	356,898	6,952,463	6.6	4.0	45.0	43.2	Yes
CR	Day						36.8	
CR	Evening						36.8	
CR	Night						36.8	
CS	Noise sensitive point: Norwegian - Yellow zone (919)	356,905	6,952,444	6.5	4.0	45.0	42.2	Yes
CS	Day						35.8	
CS	Evening						35.8	
CS	Night						35.8	
CT	Noise sensitive point: Norwegian - Yellow zone (920)	356,893	6,952,412	9.4	4.0	45.0	42.9	Yes
CT	Day						36.5	
CT	Evening						36.5	
CT	Night						36.5	
CU	Noise sensitive point: Norwegian - Yellow zone (921)	356,915	6,952,425	7.1	4.0	45.0	43.1	Yes
CU	Day						36.7	
CU	Evening						36.7	
CU	Night						36.7	
CV	Noise sensitive point: Norwegian - Yellow zone (922)	356,901	6,952,391	9.5	4.0	45.0	42.7	Yes
CV	Day						36.3	
CV	Evening						36.3	
CV	Night						36.3	
CW	Noise sensitive point: Norwegian - Yellow zone (923)	356,921	6,952,404	7.4	4.0	45.0	43.2	Yes
CW	Day						36.8	
CW	Evening						36.8	
CW	Night						36.8	

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NORD2000 - Main Result

Calculation: 2020_04_Haramsfjellet 8 x V136 HH 82 m TA1, Alternative - SO1 for T04, T06, SO2 for T05, MAP