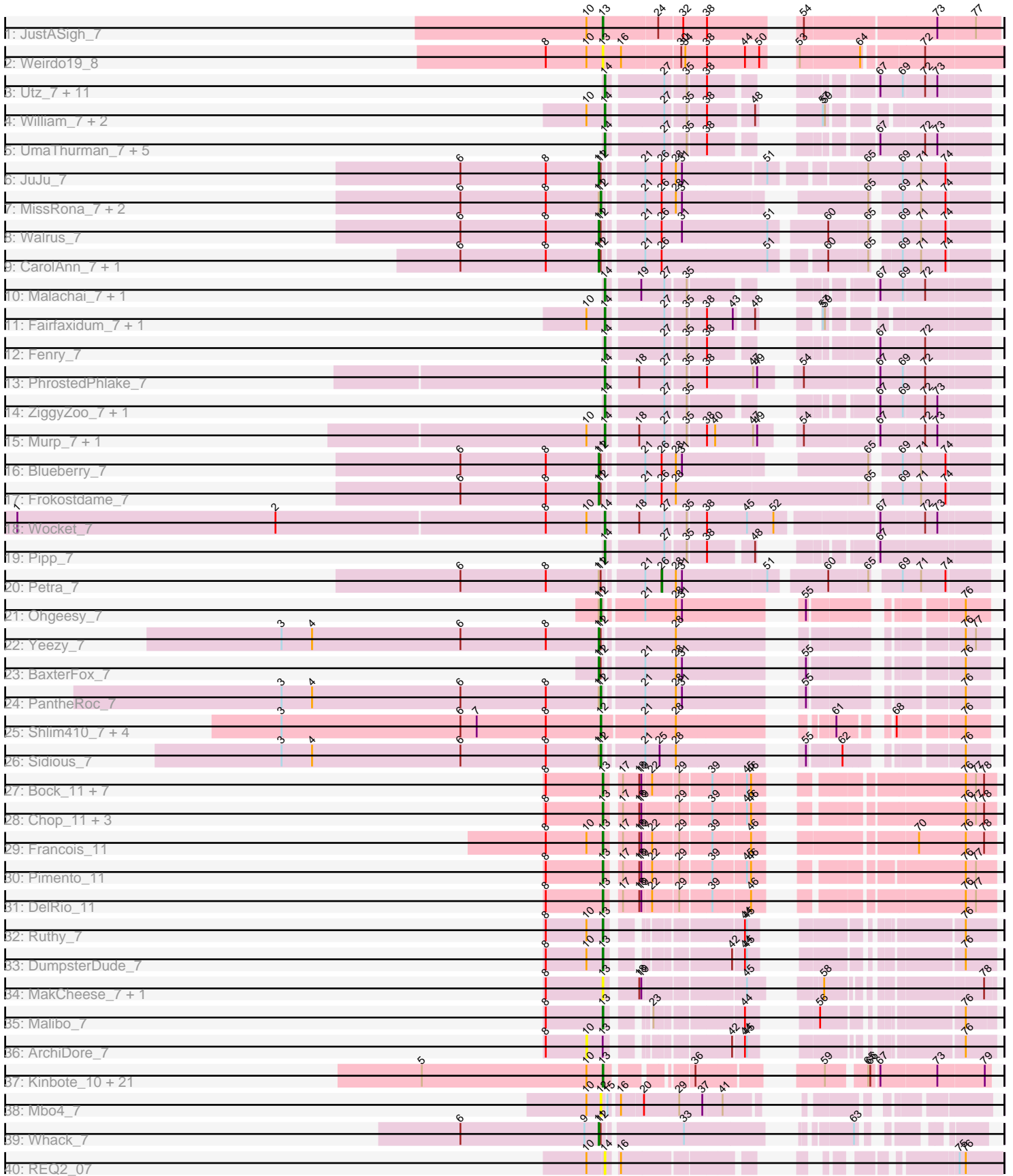


Pham 214162



Note: Tracks are now grouped by subcluster and scaled. Switching in subcluster is indicated by changes in track color. Track scale is now set by default to display the region 30 bp upstream of start 1 to 30 bp downstream of the last possible start. If this default region is judged to be packed too tightly with annotated starts, the track will be further scaled to only show that region of the ORF with annotated starts. This action will be indicated by adding "Zoomed" to the title. For starts, yellow indicates the location of called starts comprised solely of Glimmer/GeneMark auto-annotations, green indicates the location of called starts with at least 1 manual gene annotation.

## Pham 214162 Report

This analysis was run 02/22/25 on database version 588.

Pham number 214162 has 101 members, 7 are drafts.

Phages represented in each track:

- Track 1 : JustASigh\_7
- Track 2 : Weirido19\_8
- Track 3 : Utz\_7, MintFen\_7, Guacamole\_7, CaptainKirk2\_7, Zarbodnamra\_7, Lysidious\_7, Melba\_7, Barco\_7, Wisp\_7, BlingBling\_7, JasperJr\_7, Delian\_7
- Track 4 : William\_7, PCoral7\_7, Toast\_7
- Track 5 : UmaThurman\_7, Jalammah\_7, Mellie\_7, Samba\_7, Archis\_7, Hitter\_7
- Track 6 : JuJu\_7
- Track 7 : MissRona\_7, Azula\_7, Gambino\_7
- Track 8 : Walrus\_7
- Track 9 : CarolAnn\_7, Blino\_7
- Track 10 : Malachai\_7, Begonia\_7
- Track 11 : Fairfaxidum\_7, PrincePatrick\_7
- Track 12 : Fenry\_7
- Track 13 : PhrostedPhlake\_7
- Track 14 : ZiggyZoo\_7, Obliviate\_7
- Track 15 : Murp\_7, KappaFarmDelta\_7
- Track 16 : Blueberry\_7
- Track 17 : Frokostdame\_7
- Track 18 : Wocket\_7
- Track 19 : Pipp\_7
- Track 20 : Petra\_7
- Track 21 : Ohgeesy\_7
- Track 22 : Yeezy\_7
- Track 23 : BaxterFox\_7
- Track 24 : PantheRoc\_7
- Track 25 : Shlim410\_7, Hortense\_7, Howe\_7, Twinkle\_7, Adora\_7
- Track 26 : Sidious\_7
- Track 27 : Bock\_11, Mulch\_11, WheatThin\_11, Nadeem\_11, BetterKatz\_11, Brylie\_11, Parada\_11, NancyRae\_11
- Track 28 : Chop\_11, Ayotoya\_11, GrandSlam\_11, Hamood\_11
- Track 29 : Francois\_11
- Track 30 : Pimento\_11
- Track 31 : DelRio\_11
- Track 32 : Ruthy\_7
- Track 33 : DumpsterDude\_7
- Track 34 : MakCheese\_7, Zodiariah\_7
- Track 35 : Malibo\_7

- Track 36 : ArchiDore\_7
- Track 37 : Kinbote\_10, HH92\_10, Ein37\_10, OBUpride\_10, Daegal\_11, Amochick\_10, Luna22\_10, Ubuntu\_10, Evanesce\_10, DeepSoil15\_10, Dewey\_10, Amymech\_10, Gravaillia\_10, Webster2\_10, Giles\_10, Wishmaker\_10, Luke\_10, Gancho\_9, Hail\_10, LilHazelNut\_10, Hadrien\_10, Forge\_10
- Track 38 : Mbo4\_7
- Track 39 : Whack\_7
- Track 40 : REQ2\_07

**Summary of Final Annotations (See graph section above for start numbers):**

The start number called the most often in the published annotations is 13, it was called in 41 of the 94 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Amochick\_10, Amymech\_10, Ayotoya\_11, BetterKatz\_11, Bock\_11, Brylie\_11, Chop\_11, Daegal\_11, DeepSoil15\_10, DelRio\_11, Dewey\_10, DumpsterDude\_7, Ein37\_10, Evanesce\_10, Forge\_10, Francois\_11, Gancho\_9, Giles\_10, GrandSlam\_11, Gravaillia\_10, HH92\_10, Hadrien\_10, Hail\_10, Hamood\_11, JustASigh\_7, Kinbote\_10, LilHazelNut\_10, Luke\_10, Luna22\_10, MakCheese\_7, Malibo\_7, Mulch\_11, Nadeem\_11, NancyRae\_11, OBUpride\_10, Parada\_11, Pimento\_11, Ruthy\_7, Ubuntu\_10, Webster2\_10, Weirido19\_8, WheatThin\_11, Wishmaker\_10, Zodiariah\_7,

Genes that have the "Most Annotated" start but do not call it:

- ArchiDore\_7,

Genes that do not have the "Most Annotated" start:

- Adora\_7, Archis\_7, Azula\_7, Barco\_7, BaxterFox\_7, Begonia\_7, BlingBling\_7, Blino\_7, Blueberry\_7, CaptainKirk2\_7, CarolAnn\_7, Delian\_7, Fairfaxidum\_7, Fenry\_7, Frokostdame\_7, Gambino\_7, Guacamole\_7, Hitter\_7, Hortense\_7, Howe\_7, Jalammah\_7, JasperJr\_7, JuJu\_7, KappaFarmDelta\_7, Lysidious\_7, Malachai\_7, Mbo4\_7, Melba\_7, Mellie\_7, MintFen\_7, MissRona\_7, Murp\_7, Obliviate\_7, Ohgeesy\_7, PCoral7\_7, PantheRoc\_7, Petra\_7, PhrostedPhlake\_7, Pipp\_7, PrincePatrick\_7, REQ2\_07, Samba\_7, Shlim410\_7, Sidious\_7, Toast\_7, Twinkle\_7, UmaThurman\_7, Utz\_7, Walrus\_7, Whack\_7, William\_7, Wisp\_7, Wocket\_7, Yeezy\_7, Zarbodnamra\_7, ZiggyZoo\_7,

**Summary by start number:**

Start 10:

- Found in 38 of 101 ( 37.6% ) of genes in pham
- No Manual Annotations of this start.
- Called 2.6% of time when present
- Phage (with cluster) where this start called: ArchiDore\_7 (DW),

Start 11:

- Found in 16 of 101 ( 15.8% ) of genes in pham
- Manual Annotations of this start: 9 of 94
- Called 56.2% of time when present

- Phage (with cluster) where this start called: BaxterFox\_7 (CZ3), Blino\_7 (CV), Blueberry\_7 (CV), CarolAnn\_7 (CV), Frokostdame\_7 (CV), JuJu\_7 (CV), Walrus\_7 (CV), Whack\_7 (singleton), Yeezy\_7 (CZ3),

#### Start 12:

- Found in 22 of 101 ( 21.8% ) of genes in pham
- Manual Annotations of this start: 11 of 94
- Called 54.5% of time when present
- Phage (with cluster) where this start called: Adora\_7 (CZ4), Azula\_7 (CV), Gambino\_7 (CV), Hortense\_7 (CZ4), Howe\_7 (CZ4), Mbo4\_7 (singleton), MissRona\_7 (CV), Ohgeesy\_7 (CZ), PantheRoc\_7 (CZ3), Shlim410\_7 (CZ4), Sidious\_7 (CZ7), Twinkle\_7 (CZ4),

#### Start 13:

- Found in 45 of 101 ( 44.6% ) of genes in pham
- Manual Annotations of this start: 41 of 94
- Called 97.8% of time when present
- Phage (with cluster) where this start called: Amochick\_10 (Q), Amymech\_10 (Q), Ayotoya\_11 (DI), BetterKatz\_11 (DI), Bock\_11 (DI), Brylie\_11 (DI), Chop\_11 (DI), Daegal\_11 (Q), DeepSoil15\_10 (Q), DelRio\_11 (DI), Dewey\_10 (Q), DumpsterDude\_7 (DW), Ein37\_10 (Q), Evanesce\_10 (Q), Forge\_10 (Q), Francois\_11 (DI), Gancho\_9 (Q), Giles\_10 (Q), GrandSlam\_11 (DI), Gravallia\_10 (Q), HH92\_10 (Q), Hadrien\_10 (Q), Hail\_10 (Q), Hamood\_11 (DI), JustASigh\_7 (AH), Kinbote\_10 (Q), LilHazelNut\_10 (Q), Luke\_10 (Q), Luna22\_10 (Q), MakCheese\_7 (DW), Malibo\_7 (DW), Mulch\_11 (DI), Nadeem\_11 (DI), NancyRae\_11 (DI), OBUpride\_10 (Q), Parada\_11 (DI), Pimento\_11 (DI), Ruthy\_7 (DW), Ubuntu\_10 (Q), Webster2\_10 (Q), Weirdo19\_8 (AH), WheatThin\_11 (DI), Wishmaker\_10 (Q), Zodiariah\_7 (DW),

#### Start 14:

- Found in 34 of 101 ( 33.7% ) of genes in pham
- Manual Annotations of this start: 32 of 94
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Archis\_7 (CV), Barco\_7 (CV), Begonia\_7 (CV), BlingBling\_7 (CV), CaptainKirk2\_7 (CV), Delian\_7 (CV), Fairfaxidum\_7 (CV), Ferry\_7 (CV), Guacamole\_7 (CV), Hitter\_7 (CV), Jalammah\_7 (CV), JasperJr\_7 (CV), KappaFarmDelta\_7 (CV), Lysidious\_7 (CV), Malachai\_7 (CV), Melba\_7 (CV), Mellie\_7 (CV), MintFen\_7 (CV), Murp\_7 (CV), Oblivate\_7 (CV), PCoral7\_7 (CV), PhrostedPhlake\_7 (CV), Pipp\_7 (CV), PrincePatrick\_7 (CV), REQ2\_07 (singleton), Samba\_7 (CV), Toast\_7 (CV), UmaThurman\_7 (CV), Utz\_7 (CV), William\_7 (CV), Wisp\_7 (CV), Wocket\_7 (CV), Zarbodnamra\_7 (CV), ZiggyZoo\_7 (CV),

#### Start 26:

- Found in 10 of 101 ( 9.9% ) of genes in pham
- Manual Annotations of this start: 1 of 94
- Called 10.0% of time when present
- Phage (with cluster) where this start called: Petra\_7 (CV),

### Summary by clusters:

There are 10 clusters represented in this pham: singleton, DI, CZ3, CZ7, CZ4, Q, CZ, AH, DW, CV,

Info for manual annotations of cluster AH:

- Start number 13 was manually annotated 1 time for cluster AH.

Info for manual annotations of cluster CV:

- Start number 11 was manually annotated 6 times for cluster CV.
- Start number 12 was manually annotated 3 times for cluster CV.
- Start number 14 was manually annotated 32 times for cluster CV.
- Start number 26 was manually annotated 1 time for cluster CV.

Info for manual annotations of cluster CZ:

- Start number 12 was manually annotated 1 time for cluster CZ.

Info for manual annotations of cluster CZ3:

- Start number 11 was manually annotated 2 times for cluster CZ3.
- Start number 12 was manually annotated 1 time for cluster CZ3.

Info for manual annotations of cluster CZ4:

- Start number 12 was manually annotated 5 times for cluster CZ4.

Info for manual annotations of cluster CZ7:

- Start number 12 was manually annotated 1 time for cluster CZ7.

Info for manual annotations of cluster DI:

- Start number 13 was manually annotated 15 times for cluster DI.

Info for manual annotations of cluster DW:

- Start number 13 was manually annotated 3 times for cluster DW.

Info for manual annotations of cluster Q:

- Start number 13 was manually annotated 22 times for cluster Q.

### ***Gene Information:***

Gene: Adora\_7 Start: 5836, Stop: 6276, Start Num: 12

Candidate Starts for Adora\_7:

(3, 5365), (6, 5629), (7, 5653), (8, 5755), (Start: 12 @5836 has 11 MA's), (21, 5896), (28, 5941), (61, 6106), (68, 6157), (76, 6241),

Gene: Amochick\_10 Start: 7533, Stop: 7973, Start Num: 13

Candidate Starts for Amochick\_10:

(5, 7266), (10, 7509), (Start: 13 @7533 has 41 MA's), (36, 7629), (59, 7758), (65, 7806), (66, 7809), (67, 7818), (73, 7899), (79, 7965),

Gene: Amymech\_10 Start: 7539, Stop: 7979, Start Num: 13

Candidate Starts for Amymech\_10:

(5, 7272), (10, 7515), (Start: 13 @7539 has 41 MA's), (36, 7635), (59, 7764), (65, 7812), (66, 7815), (67, 7824), (73, 7905), (79, 7971),

Gene: ArchiDore\_7 Start: 6321, Stop: 6746, Start Num: 10

Candidate Starts for ArchiDore\_7:

(8, 6261), (10, 6321), (Start: 13 @6345 has 41 MA's), (42, 6480), (44, 6495), (45, 6498), (76, 6702),

Gene: Archis\_7 Start: 6142, Stop: 6570, Start Num: 14  
Candidate Starts for Archis\_7:  
(Start: 14 @6142 has 32 MA's), (27, 6217), (35, 6244), (38, 6268), (67, 6418), (72, 6481), (73, 6499),

Gene: Ayotoya\_11 Start: 8058, Stop: 8519, Start Num: 13  
Candidate Starts for Ayotoya\_11:  
(8, 7974), (Start: 13 @8058 has 41 MA's), (17, 8073), (18, 8097), (19, 8100), (29, 8148), (39, 8190),  
(45, 8235), (46, 8241), (76, 8475), (77, 8490), (78, 8502),

Gene: Azula\_7 Start: 5970, Stop: 6446, Start Num: 12  
Candidate Starts for Azula\_7:  
(6, 5763), (8, 5889), (Start: 11 @5967 has 9 MA's), (Start: 12 @5970 has 11 MA's), (21, 6021), (Start:  
26 @6045 has 1 MA's), (28, 6066), (31, 6075), (65, 6291), (69, 6324), (71, 6351), (74, 6387),

Gene: Barco\_7 Start: 6142, Stop: 6570, Start Num: 14  
Candidate Starts for Barco\_7:  
(Start: 14 @6142 has 32 MA's), (27, 6217), (35, 6244), (38, 6268), (67, 6418), (69, 6451), (72, 6481),  
(73, 6499),

Gene: BaxterFox\_7 Start: 5821, Stop: 6270, Start Num: 11  
Candidate Starts for BaxterFox\_7:  
(Start: 11 @5821 has 9 MA's), (Start: 12 @5824 has 11 MA's), (21, 5875), (28, 5920), (31, 5929), (55,  
6058), (76, 6235),

Gene: Begonia\_7 Start: 6145, Stop: 6573, Start Num: 14  
Candidate Starts for Begonia\_7:  
(Start: 14 @6145 has 32 MA's), (19, 6187), (27, 6220), (35, 6247), (67, 6421), (69, 6454), (72, 6484),

Gene: BetterKatz\_11 Start: 8026, Stop: 8487, Start Num: 13  
Candidate Starts for BetterKatz\_11:  
(8, 7942), (Start: 13 @8026 has 41 MA's), (17, 8041), (18, 8065), (19, 8068), (22, 8080), (29, 8116),  
(39, 8158), (45, 8203), (46, 8209), (76, 8443), (77, 8458), (78, 8470),

Gene: BlingBling\_7 Start: 6142, Stop: 6570, Start Num: 14  
Candidate Starts for BlingBling\_7:  
(Start: 14 @6142 has 32 MA's), (27, 6217), (35, 6244), (38, 6268), (67, 6418), (69, 6451), (72, 6481),  
(73, 6499),

Gene: Blino\_7 Start: 5970, Stop: 6470, Start Num: 11  
Candidate Starts for Blino\_7:  
(6, 5766), (8, 5892), (Start: 11 @5970 has 9 MA's), (Start: 12 @5973 has 11 MA's), (21, 6024), (Start:  
26 @6048 has 1 MA's), (51, 6201), (60, 6264), (65, 6318), (69, 6348), (71, 6375), (74, 6411),

Gene: Blueberry\_7 Start: 5967, Stop: 6446, Start Num: 11  
Candidate Starts for Blueberry\_7:  
(6, 5763), (8, 5889), (Start: 11 @5967 has 9 MA's), (Start: 12 @5970 has 11 MA's), (21, 6021), (Start:  
26 @6045 has 1 MA's), (28, 6066), (31, 6075), (65, 6291), (69, 6324), (71, 6351), (74, 6387),

Gene: Bock\_11 Start: 7776, Stop: 8237, Start Num: 13  
Candidate Starts for Bock\_11:  
(8, 7692), (Start: 13 @7776 has 41 MA's), (17, 7791), (18, 7815), (19, 7818), (22, 7830), (29, 7866),  
(39, 7908), (45, 7953), (46, 7959), (76, 8193), (77, 8208), (78, 8220),

Gene: Brylie\_11 Start: 7773, Stop: 8234, Start Num: 13

Candidate Starts for Brylie\_11:

(8, 7689), (Start: 13 @7773 has 41 MA's), (17, 7788), (18, 7812), (19, 7815), (22, 7827), (29, 7863), (39, 7905), (45, 7950), (46, 7956), (76, 8190), (77, 8205), (78, 8217),

Gene: CaptainKirk2\_7 Start: 6142, Stop: 6570, Start Num: 14

Candidate Starts for CaptainKirk2\_7:

(Start: 14 @6142 has 32 MA's), (27, 6217), (35, 6244), (38, 6268), (67, 6418), (69, 6451), (72, 6481), (73, 6499),

Gene: CarolAnn\_7 Start: 5969, Stop: 6469, Start Num: 11

Candidate Starts for CarolAnn\_7:

(6, 5765), (8, 5891), (Start: 11 @5969 has 9 MA's), (Start: 12 @5972 has 11 MA's), (21, 6023), (Start: 26 @6047 has 1 MA's), (51, 6200), (60, 6263), (65, 6317), (69, 6347), (71, 6374), (74, 6410),

Gene: Chop\_11 Start: 7806, Stop: 8267, Start Num: 13

Candidate Starts for Chop\_11:

(8, 7722), (Start: 13 @7806 has 41 MA's), (17, 7821), (18, 7845), (19, 7848), (29, 7896), (39, 7938), (45, 7983), (46, 7989), (76, 8223), (77, 8238), (78, 8250),

Gene: Daegal\_11 Start: 7830, Stop: 8270, Start Num: 13

Candidate Starts for Daegal\_11:

(5, 7563), (10, 7806), (Start: 13 @7830 has 41 MA's), (36, 7926), (59, 8055), (65, 8103), (66, 8106), (67, 8115), (73, 8196), (79, 8262),

Gene: DeepSoil15\_10 Start: 7539, Stop: 7979, Start Num: 13

Candidate Starts for DeepSoil15\_10:

(5, 7272), (10, 7515), (Start: 13 @7539 has 41 MA's), (36, 7635), (59, 7764), (65, 7812), (66, 7815), (67, 7824), (73, 7905), (79, 7971),

Gene: DelRio\_11 Start: 8070, Stop: 8531, Start Num: 13

Candidate Starts for DelRio\_11:

(8, 7986), (Start: 13 @8070 has 41 MA's), (17, 8085), (18, 8109), (19, 8112), (22, 8124), (29, 8160), (39, 8202), (46, 8253), (76, 8487), (77, 8502),

Gene: Delian\_7 Start: 6142, Stop: 6570, Start Num: 14

Candidate Starts for Delian\_7:

(Start: 14 @6142 has 32 MA's), (27, 6217), (35, 6244), (38, 6268), (67, 6418), (69, 6451), (72, 6481), (73, 6499),

Gene: Dewey\_10 Start: 7539, Stop: 7979, Start Num: 13

Candidate Starts for Dewey\_10:

(5, 7272), (10, 7515), (Start: 13 @7539 has 41 MA's), (36, 7635), (59, 7764), (65, 7812), (66, 7815), (67, 7824), (73, 7905), (79, 7971),

Gene: DumpsterDude\_7 Start: 6346, Stop: 6756, Start Num: 13

Candidate Starts for DumpsterDude\_7:

(8, 6262), (10, 6322), (Start: 13 @6346 has 41 MA's), (42, 6481), (44, 6496), (45, 6499), (76, 6712),

Gene: Ein37\_10 Start: 7539, Stop: 7979, Start Num: 13

Candidate Starts for Ein37\_10:

(5, 7272), (10, 7515), (Start: 13 @7539 has 41 MA's), (36, 7635), (59, 7764), (65, 7812), (66, 7815), (67, 7824), (73, 7905), (79, 7971),

Gene: Evanesce\_10 Start: 7539, Stop: 7979, Start Num: 13

Candidate Starts for Evanesce\_10:

(5, 7272), (10, 7515), (Start: 13 @7539 has 41 MA's), (36, 7635), (59, 7764), (65, 7812), (66, 7815), (67, 7824), (73, 7905), (79, 7971),

Gene: Fairfaxidum\_7 Start: 6141, Stop: 6554, Start Num: 14

Candidate Starts for Fairfaxidum\_7:

(10, 6114), (Start: 14 @6141 has 32 MA's), (27, 6216), (35, 6243), (38, 6267), (43, 6303), (48, 6327), (57, 6354), (59, 6357),

Gene: Fenry\_7 Start: 6145, Stop: 6579, Start Num: 14

Candidate Starts for Fenry\_7:

(Start: 14 @6145 has 32 MA's), (27, 6220), (35, 6247), (38, 6271), (67, 6427), (72, 6490),

Gene: Forge\_10 Start: 7539, Stop: 7979, Start Num: 13

Candidate Starts for Forge\_10:

(5, 7272), (10, 7515), (Start: 13 @7539 has 41 MA's), (36, 7635), (59, 7764), (65, 7812), (66, 7815), (67, 7824), (73, 7905), (79, 7971),

Gene: Francois\_11 Start: 7775, Stop: 8248, Start Num: 13

Candidate Starts for Francois\_11:

(8, 7691), (10, 7751), (Start: 13 @7775 has 41 MA's), (17, 7790), (18, 7814), (19, 7817), (22, 7829), (29, 7865), (39, 7907), (46, 7958), (70, 8135), (76, 8204), (78, 8231),

Gene: Frokostdame\_7 Start: 6038, Stop: 6565, Start Num: 11

Candidate Starts for Frokostdame\_7:

(6, 5834), (8, 5960), (Start: 11 @6038 has 9 MA's), (Start: 12 @6041 has 11 MA's), (21, 6092), (Start: 26 @6116 has 1 MA's), (28, 6137), (65, 6410), (69, 6443), (71, 6470), (74, 6506),

Gene: Gambino\_7 Start: 5970, Stop: 6446, Start Num: 12

Candidate Starts for Gambino\_7:

(6, 5763), (8, 5889), (Start: 11 @5967 has 9 MA's), (Start: 12 @5970 has 11 MA's), (21, 6021), (Start: 26 @6045 has 1 MA's), (28, 6066), (31, 6075), (65, 6291), (69, 6324), (71, 6351), (74, 6387),

Gene: Gancho\_9 Start: 7239, Stop: 7679, Start Num: 13

Candidate Starts for Gancho\_9:

(5, 6972), (10, 7215), (Start: 13 @7239 has 41 MA's), (36, 7335), (59, 7464), (65, 7512), (66, 7515), (67, 7524), (73, 7605), (79, 7671),

Gene: Giles\_10 Start: 7539, Stop: 7979, Start Num: 13

Candidate Starts for Giles\_10:

(5, 7272), (10, 7515), (Start: 13 @7539 has 41 MA's), (36, 7635), (59, 7764), (65, 7812), (66, 7815), (67, 7824), (73, 7905), (79, 7971),

Gene: GrandSlam\_11 Start: 7806, Stop: 8267, Start Num: 13

Candidate Starts for GrandSlam\_11:

(8, 7722), (Start: 13 @7806 has 41 MA's), (17, 7821), (18, 7845), (19, 7848), (29, 7896), (39, 7938), (45, 7983), (46, 7989), (76, 8223), (77, 8238), (78, 8250),

Gene: Gravaillia\_10 Start: 7272, Stop: 7712, Start Num: 13

Candidate Starts for Gravaillia\_10:



(5, 7005), (10, 7248), (Start: 13 @7272 has 41 MA's), (36, 7368), (59, 7497), (65, 7545), (66, 7548), (67, 7557), (73, 7638), (79, 7704),

Gene: Guacamole\_7 Start: 6146, Stop: 6574, Start Num: 14

Candidate Starts for Guacamole\_7:

(Start: 14 @6146 has 32 MA's), (27, 6221), (35, 6248), (38, 6272), (67, 6422), (69, 6455), (72, 6485), (73, 6503),

Gene: HH92\_10 Start: 7539, Stop: 7979, Start Num: 13

Candidate Starts for HH92\_10:

(5, 7272), (10, 7515), (Start: 13 @7539 has 41 MA's), (36, 7635), (59, 7764), (65, 7812), (66, 7815), (67, 7824), (73, 7905), (79, 7971),

Gene: Hadrien\_10 Start: 7539, Stop: 7979, Start Num: 13

Candidate Starts for Hadrien\_10:

(5, 7272), (10, 7515), (Start: 13 @7539 has 41 MA's), (36, 7635), (59, 7764), (65, 7812), (66, 7815), (67, 7824), (73, 7905), (79, 7971),

Gene: Hail\_10 Start: 7539, Stop: 7979, Start Num: 13

Candidate Starts for Hail\_10:

(5, 7272), (10, 7515), (Start: 13 @7539 has 41 MA's), (36, 7635), (59, 7764), (65, 7812), (66, 7815), (67, 7824), (73, 7905), (79, 7971),

Gene: Hamood\_11 Start: 7806, Stop: 8267, Start Num: 13

Candidate Starts for Hamood\_11:

(8, 7722), (Start: 13 @7806 has 41 MA's), (17, 7821), (18, 7845), (19, 7848), (29, 7896), (39, 7938), (45, 7983), (46, 7989), (76, 8223), (77, 8238), (78, 8250),

Gene: Hitter\_7 Start: 6142, Stop: 6570, Start Num: 14

Candidate Starts for Hitter\_7:

(Start: 14 @6142 has 32 MA's), (27, 6217), (35, 6244), (38, 6268), (67, 6418), (72, 6481), (73, 6499),

Gene: Hortense\_7 Start: 5836, Stop: 6276, Start Num: 12

Candidate Starts for Hortense\_7:

(3, 5365), (6, 5629), (7, 5653), (8, 5755), (Start: 12 @5836 has 11 MA's), (21, 5896), (28, 5941), (61, 6106), (68, 6157), (76, 6241),

Gene: Howe\_7 Start: 5836, Stop: 6276, Start Num: 12

Candidate Starts for Howe\_7:

(3, 5365), (6, 5629), (7, 5653), (8, 5755), (Start: 12 @5836 has 11 MA's), (21, 5896), (28, 5941), (61, 6106), (68, 6157), (76, 6241),

Gene: Jalammah\_7 Start: 6142, Stop: 6570, Start Num: 14

Candidate Starts for Jalammah\_7:

(Start: 14 @6142 has 32 MA's), (27, 6217), (35, 6244), (38, 6268), (67, 6418), (72, 6481), (73, 6499),

Gene: JasperJr\_7 Start: 6146, Stop: 6574, Start Num: 14

Candidate Starts for JasperJr\_7:

(Start: 14 @6146 has 32 MA's), (27, 6221), (35, 6248), (38, 6272), (67, 6422), (69, 6455), (72, 6485), (73, 6503),

Gene: JuJu\_7 Start: 5980, Stop: 6495, Start Num: 11

Candidate Starts for JuJu\_7:

(6, 5776), (8, 5902), (Start: 11 @5980 has 9 MA's), (Start: 12 @5983 has 11 MA's), (21, 6034), (Start: 26 @6058 has 1 MA's), (28, 6079), (31, 6088), (51, 6205), (65, 6322), (69, 6373), (71, 6400), (74, 6436),

Gene: JustASigh\_7 Start: 6534, Stop: 7046, Start Num: 13

Candidate Starts for JustASigh\_7:

(10, 6510), (Start: 13 @6534 has 41 MA's), (24, 6612), (32, 6645), (38, 6678), (54, 6774), (73, 6957), (77, 7011),

Gene: KappaFarmDelta\_7 Start: 6123, Stop: 6608, Start Num: 14

Candidate Starts for KappaFarmDelta\_7:

(10, 6099), (Start: 14 @6123 has 32 MA's), (18, 6162), (27, 6198), (35, 6225), (38, 6249), (40, 6261), (47, 6315), (49, 6321), (54, 6354), (67, 6456), (72, 6519), (73, 6537),

Gene: Kinbote\_10 Start: 7539, Stop: 7979, Start Num: 13

Candidate Starts for Kinbote\_10:

(5, 7272), (10, 7515), (Start: 13 @7539 has 41 MA's), (36, 7635), (59, 7764), (65, 7812), (66, 7815), (67, 7824), (73, 7905), (79, 7971),

Gene: LilHazelnut\_10 Start: 7539, Stop: 7979, Start Num: 13

Candidate Starts for LilHazelnut\_10:

(5, 7272), (10, 7515), (Start: 13 @7539 has 41 MA's), (36, 7635), (59, 7764), (65, 7812), (66, 7815), (67, 7824), (73, 7905), (79, 7971),

Gene: Luke\_10 Start: 7539, Stop: 7979, Start Num: 13

Candidate Starts for Luke\_10:

(5, 7272), (10, 7515), (Start: 13 @7539 has 41 MA's), (36, 7635), (59, 7764), (65, 7812), (66, 7815), (67, 7824), (73, 7905), (79, 7971),

Gene: Luna22\_10 Start: 7539, Stop: 7979, Start Num: 13

Candidate Starts for Luna22\_10:

(5, 7272), (10, 7515), (Start: 13 @7539 has 41 MA's), (36, 7635), (59, 7764), (65, 7812), (66, 7815), (67, 7824), (73, 7905), (79, 7971),

Gene: Lysidious\_7 Start: 6142, Stop: 6570, Start Num: 14

Candidate Starts for Lysidious\_7:

(Start: 14 @6142 has 32 MA's), (27, 6217), (35, 6244), (38, 6268), (67, 6418), (69, 6451), (72, 6481), (73, 6499),

Gene: MakCheese\_7 Start: 6342, Stop: 6779, Start Num: 13

Candidate Starts for MakCheese\_7:

(8, 6258), (Start: 13 @6342 has 41 MA's), (18, 6381), (19, 6384), (45, 6519), (58, 6579), (78, 6765),

Gene: Malachai\_7 Start: 6145, Stop: 6573, Start Num: 14

Candidate Starts for Malachai\_7:

(Start: 14 @6145 has 32 MA's), (19, 6187), (27, 6220), (35, 6247), (67, 6421), (69, 6454), (72, 6484),

Gene: Malibo\_7 Start: 6358, Stop: 6762, Start Num: 13

Candidate Starts for Malibo\_7:

(8, 6274), (Start: 13 @6358 has 41 MA's), (23, 6397), (44, 6508), (56, 6556), (76, 6721),

Gene: Mbo4\_7 Start: 6382, Stop: 6798, Start Num: 12

Candidate Starts for Mbo4\_7:

(10, 6361), (Start: 12 @6382 has 11 MA's), (15, 6388), (16, 6400), (20, 6430), (29, 6481), (37, 6514), (41, 6541),

Gene: Melba\_7 Start: 6142, Stop: 6570, Start Num: 14

Candidate Starts for Melba\_7:

(Start: 14 @6142 has 32 MA's), (27, 6217), (35, 6244), (38, 6268), (67, 6418), (69, 6451), (72, 6481), (73, 6499),

Gene: Mellie\_7 Start: 6142, Stop: 6570, Start Num: 14

Candidate Starts for Mellie\_7:

(Start: 14 @6142 has 32 MA's), (27, 6217), (35, 6244), (38, 6268), (67, 6418), (72, 6481), (73, 6499),

Gene: MintFen\_7 Start: 6142, Stop: 6570, Start Num: 14

Candidate Starts for MintFen\_7:

(Start: 14 @6142 has 32 MA's), (27, 6217), (35, 6244), (38, 6268), (67, 6418), (69, 6451), (72, 6481), (73, 6499),

Gene: MissRona\_7 Start: 5970, Stop: 6446, Start Num: 12

Candidate Starts for MissRona\_7:

(6, 5763), (8, 5889), (Start: 11 @5967 has 9 MA's), (Start: 12 @5970 has 11 MA's), (21, 6021), (Start: 26 @6045 has 1 MA's), (28, 6066), (31, 6075), (65, 6291), (69, 6324), (71, 6351), (74, 6387),

Gene: Mulch\_11 Start: 7773, Stop: 8234, Start Num: 13

Candidate Starts for Mulch\_11:

(8, 7689), (Start: 13 @7773 has 41 MA's), (17, 7788), (18, 7812), (19, 7815), (22, 7827), (29, 7863), (39, 7905), (45, 7950), (46, 7956), (76, 8190), (77, 8205), (78, 8217),

Gene: Murp\_7 Start: 6126, Stop: 6611, Start Num: 14

Candidate Starts for Murp\_7:

(10, 6102), (Start: 14 @6126 has 32 MA's), (18, 6165), (27, 6201), (35, 6228), (38, 6252), (40, 6264), (47, 6318), (49, 6324), (54, 6357), (67, 6459), (72, 6522), (73, 6540),

Gene: Nadeem\_11 Start: 7773, Stop: 8234, Start Num: 13

Candidate Starts for Nadeem\_11:

(8, 7689), (Start: 13 @7773 has 41 MA's), (17, 7788), (18, 7812), (19, 7815), (22, 7827), (29, 7863), (39, 7905), (45, 7950), (46, 7956), (76, 8190), (77, 8205), (78, 8217),

Gene: NancyRae\_11 Start: 7773, Stop: 8234, Start Num: 13

Candidate Starts for NancyRae\_11:

(8, 7689), (Start: 13 @7773 has 41 MA's), (17, 7788), (18, 7812), (19, 7815), (22, 7827), (29, 7863), (39, 7905), (45, 7950), (46, 7956), (76, 8190), (77, 8205), (78, 8217),

Gene: OBUpride\_10 Start: 7533, Stop: 7973, Start Num: 13

Candidate Starts for OBUpride\_10:

(5, 7266), (10, 7509), (Start: 13 @7533 has 41 MA's), (36, 7629), (59, 7758), (65, 7806), (66, 7809), (67, 7818), (73, 7899), (79, 7965),

Gene: Obliviate\_7 Start: 6166, Stop: 6594, Start Num: 14

Candidate Starts for Obliviate\_7:

(Start: 14 @6166 has 32 MA's), (27, 6241), (35, 6268), (67, 6442), (69, 6475), (72, 6505), (73, 6523),

Gene: Ohgeesy\_7 Start: 5824, Stop: 6270, Start Num: 12

Candidate Starts for Ohgeesy\_7:

(Start: 11 @5821 has 9 MA's), (Start: 12 @5824 has 11 MA's), (21, 5875), (28, 5920), (31, 5929), (55, 6058), (76, 6235),

Gene: PCoral7\_7 Start: 6141, Stop: 6554, Start Num: 14

Candidate Starts for PCoral7\_7:

(10, 6114), (Start: 14 @6141 has 32 MA's), (27, 6216), (35, 6243), (38, 6267), (48, 6327), (57, 6354), (59, 6357),

Gene: PantheRoc\_7 Start: 5824, Stop: 6270, Start Num: 12

Candidate Starts for PantheRoc\_7:

(3, 5353), (4, 5398), (6, 5617), (8, 5743), (Start: 11 @5821 has 9 MA's), (Start: 12 @5824 has 11 MA's), (21, 5875), (28, 5920), (31, 5929), (55, 6058), (76, 6235),

Gene: Parada\_11 Start: 7773, Stop: 8234, Start Num: 13

Candidate Starts for Parada\_11:

(8, 7689), (Start: 13 @7773 has 41 MA's), (17, 7788), (18, 7812), (19, 7815), (22, 7827), (29, 7863), (39, 7905), (45, 7950), (46, 7956), (76, 8190), (77, 8205), (78, 8217),

Gene: Petra\_7 Start: 6045, Stop: 6476, Start Num: 26

Candidate Starts for Petra\_7:

(6, 5763), (8, 5889), (Start: 11 @5967 has 9 MA's), (Start: 12 @5970 has 11 MA's), (21, 6021), (Start: 26 @6045 has 1 MA's), (28, 6066), (31, 6075), (51, 6195), (60, 6267), (65, 6321), (69, 6354), (71, 6381), (74, 6417),

Gene: PhrostedPhlake\_7 Start: 6160, Stop: 6651, Start Num: 14

Candidate Starts for PhrostedPhlake\_7:

(Start: 14 @6160 has 32 MA's), (18, 6199), (27, 6235), (35, 6262), (38, 6286), (47, 6352), (49, 6358), (54, 6397), (67, 6499), (69, 6532), (72, 6562),

Gene: Pimento\_11 Start: 7770, Stop: 8225, Start Num: 13

Candidate Starts for Pimento\_11:

(8, 7686), (Start: 13 @7770 has 41 MA's), (17, 7785), (18, 7809), (19, 7812), (22, 7824), (29, 7860), (39, 7902), (45, 7947), (46, 7953), (76, 8181), (77, 8196),

Gene: Pipp\_7 Start: 6166, Stop: 6594, Start Num: 14

Candidate Starts for Pipp\_7:

(Start: 14 @6166 has 32 MA's), (27, 6241), (35, 6268), (38, 6292), (48, 6349), (67, 6442),

Gene: PrincePatrick\_7 Start: 6142, Stop: 6555, Start Num: 14

Candidate Starts for PrincePatrick\_7:

(10, 6115), (Start: 14 @6142 has 32 MA's), (27, 6217), (35, 6244), (38, 6268), (43, 6304), (48, 6328), (57, 6355), (59, 6358),

Gene: REQ2\_07 Start: 5849, Stop: 6256, Start Num: 14

Candidate Starts for REQ2\_07:

(10, 5825), (Start: 14 @5849 has 32 MA's), (16, 5861), (75, 6194), (76, 6203),

Gene: Ruthy\_7 Start: 6423, Stop: 6830, Start Num: 13

Candidate Starts for Ruthy\_7:

(8, 6339), (10, 6399), (Start: 13 @6423 has 41 MA's), (44, 6573), (45, 6576), (76, 6786),

Gene: Samba\_7 Start: 6143, Stop: 6571, Start Num: 14

Candidate Starts for Samba\_7:

(Start: 14 @6143 has 32 MA's), (27, 6218), (35, 6245), (38, 6269), (67, 6419), (72, 6482), (73, 6500),

Gene: Shlim410\_7 Start: 5836, Stop: 6276, Start Num: 12

Candidate Starts for Shlim410\_7:

(3, 5365), (6, 5629), (7, 5653), (8, 5755), (Start: 12 @5836 has 11 MA's), (21, 5896), (28, 5941), (61, 6106), (68, 6157), (76, 6241),

Gene: Sidious\_7 Start: 5827, Stop: 6273, Start Num: 12

Candidate Starts for Sidious\_7:

(3, 5356), (4, 5401), (6, 5620), (8, 5746), (Start: 11 @5824 has 9 MA's), (Start: 12 @5827 has 11 MA's), (21, 5878), (25, 5899), (28, 5923), (55, 6061), (62, 6106), (76, 6238),

Gene: Toast\_7 Start: 6141, Stop: 6554, Start Num: 14

Candidate Starts for Toast\_7:

(10, 6114), (Start: 14 @6141 has 32 MA's), (27, 6216), (35, 6243), (38, 6267), (48, 6327), (57, 6354), (59, 6357),

Gene: Twinkle\_7 Start: 5836, Stop: 6276, Start Num: 12

Candidate Starts for Twinkle\_7:

(3, 5365), (6, 5629), (7, 5653), (8, 5755), (Start: 12 @5836 has 11 MA's), (21, 5896), (28, 5941), (61, 6106), (68, 6157), (76, 6241),

Gene: Ubuntu\_10 Start: 7539, Stop: 7979, Start Num: 13

Candidate Starts for Ubuntu\_10:

(5, 7272), (10, 7515), (Start: 13 @7539 has 41 MA's), (36, 7635), (59, 7764), (65, 7812), (66, 7815), (67, 7824), (73, 7905), (79, 7971),

Gene: UmaThurman\_7 Start: 6142, Stop: 6570, Start Num: 14

Candidate Starts for UmaThurman\_7:

(Start: 14 @6142 has 32 MA's), (27, 6217), (35, 6244), (38, 6268), (67, 6418), (72, 6481), (73, 6499),

Gene: Utz\_7 Start: 6142, Stop: 6570, Start Num: 14

Candidate Starts for Utz\_7:

(Start: 14 @6142 has 32 MA's), (27, 6217), (35, 6244), (38, 6268), (67, 6418), (69, 6451), (72, 6481), (73, 6499),

Gene: Walrus\_7 Start: 5970, Stop: 6482, Start Num: 11

Candidate Starts for Walrus\_7:

(6, 5766), (8, 5892), (Start: 11 @5970 has 9 MA's), (Start: 12 @5973 has 11 MA's), (21, 6024), (Start: 26 @6048 has 1 MA's), (31, 6078), (51, 6201), (60, 6273), (65, 6327), (69, 6360), (71, 6387), (74, 6423),

Gene: Webster2\_10 Start: 7539, Stop: 7979, Start Num: 13

Candidate Starts for Webster2\_10:

(5, 7272), (10, 7515), (Start: 13 @7539 has 41 MA's), (36, 7635), (59, 7764), (65, 7812), (66, 7815), (67, 7824), (73, 7905), (79, 7971),

Gene: Weirido19\_8 Start: 6377, Stop: 6886, Start Num: 13

Candidate Starts for Weirido19\_8:

(8, 6293), (10, 6353), (Start: 13 @6377 has 41 MA's), (16, 6404), (30, 6485), (34, 6491), (38, 6521), (44, 6575), (50, 6596), (53, 6611), (64, 6695), (72, 6773),

Gene: Whack\_7 Start: 5839, Stop: 6255, Start Num: 11

Candidate Starts for Whack\_7:

(6, 5635), (9, 5818), (Start: 11 @5839 has 9 MA's), (Start: 12 @5842 has 11 MA's), (33, 5950), (63, 6127),

Gene: WheatThin\_11 Start: 7773, Stop: 8234, Start Num: 13

Candidate Starts for WheatThin\_11:

(8, 7689), (Start: 13 @7773 has 41 MA's), (17, 7788), (18, 7812), (19, 7815), (22, 7827), (29, 7863), (39, 7905), (45, 7950), (46, 7956), (76, 8190), (77, 8205), (78, 8217),

Gene: William\_7 Start: 6141, Stop: 6569, Start Num: 14

Candidate Starts for William\_7:

(10, 6114), (Start: 14 @6141 has 32 MA's), (27, 6216), (35, 6243), (38, 6267), (48, 6327), (57, 6369), (59, 6372),

Gene: Wishmaker\_10 Start: 7539, Stop: 7979, Start Num: 13

Candidate Starts for Wishmaker\_10:

(5, 7272), (10, 7515), (Start: 13 @7539 has 41 MA's), (36, 7635), (59, 7764), (65, 7812), (66, 7815), (67, 7824), (73, 7905), (79, 7971),

Gene: Wisp\_7 Start: 6142, Stop: 6570, Start Num: 14

Candidate Starts for Wisp\_7:

(Start: 14 @6142 has 32 MA's), (27, 6217), (35, 6244), (38, 6268), (67, 6418), (69, 6451), (72, 6481), (73, 6499),

Gene: Wocket\_7 Start: 6129, Stop: 6635, Start Num: 14

Candidate Starts for Wocket\_7:

(1, 5271), (2, 5652), (8, 6045), (10, 6105), (Start: 14 @6129 has 32 MA's), (18, 6168), (27, 6204), (35, 6231), (38, 6255), (45, 6312), (52, 6351), (67, 6483), (72, 6546), (73, 6564),

Gene: Yeezy\_7 Start: 5821, Stop: 6270, Start Num: 11

Candidate Starts for Yeezy\_7:

(3, 5353), (4, 5398), (6, 5617), (8, 5743), (Start: 11 @5821 has 9 MA's), (Start: 12 @5824 has 11 MA's), (28, 5920), (76, 6235), (77, 6250),

Gene: Zarbodnamra\_7 Start: 6141, Stop: 6569, Start Num: 14

Candidate Starts for Zarbodnamra\_7:

(Start: 14 @6141 has 32 MA's), (27, 6216), (35, 6243), (38, 6267), (67, 6417), (69, 6450), (72, 6480), (73, 6498),

Gene: ZiggyZoo\_7 Start: 6166, Stop: 6594, Start Num: 14

Candidate Starts for ZiggyZoo\_7:

(Start: 14 @6166 has 32 MA's), (27, 6241), (35, 6268), (67, 6442), (69, 6475), (72, 6505), (73, 6523),

Gene: Zodiariah\_7 Start: 6347, Stop: 6769, Start Num: 13

Candidate Starts for Zodiariah\_7:

(8, 6263), (Start: 13 @6347 has 41 MA's), (18, 6386), (19, 6389), (45, 6524), (58, 6569), (78, 6755),